SCC Inc.

Installation Instructions

Document No. TS-6600

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TS… Touchscreen Kits with Profinet/ProfiBus for use with LMV3..., LMV5...Controls

Description

TS… series touchscreen kits provide a human machine interface (HMI) when used with a Siemens LMV3... or LMV5... linkageless control. Each kit provides boiler burner data collection and trending for a hydronic or steam boiler.

A RTA Protocol Gateway provides Profinet or Profibus BMS communication to a TS-MS... Series Master Lead/Lag Panel, TS-CE… Combustion enclosures, TS… communication kits and/or TS-D… Deaerator/Surge panel control systems.

This document provides an address list for Profinet and a programming example using a Siemens S7 PLC.

Configuration

The RTA Modbus TCP/IP to Profinet protocol gateway comes pre-programmed to work with one LMV3…LMV5… with a TS Series touchscreen kit. Multiple protocol gateways are needed for multiple boilers, deaerator panels, surge panels and lead/lag panels.

To view settings or make changes to the RTA protocol gateway a username and password are required. This will be necessary to change the client side IP Address that the Profinet is serving to the Profinet network.

Page 46 of this document is an example of how to setup a Siemens S7 series PLC to receive the Profinet data being provided from the RTA protocol gateway.

Included with this manual will be a CD-ROM from RTA Automation which provide utility programs, manuals, and all GSD files associated with this gateway to enable integration to your Profinet controller/network.

Settings

Access:
Open a web browser and enter the following IP Address.
IP Address: 192.168.1.71

Login:
Username: SETUP
Password: START

IP Address change, RTA protocol gateway:
Enter “Configuration Mode”, select “Edit” to change and “Restart Now” when finished.
IP Address: 192.168.1.71
Subnet: 255.255.255.0
Default Gateway: 192.168.1.1
DNS Gateway: 8.8.8.8
Note: These are the network settings that will be used on your Profinet network.

IP Address change, Modbus TCP/IP Client:
Enter “Configuration Mode”, select “Modbus TCP/IP Client” to change and “Restart Now” when finished.
IP Address: 192.168.1.60 = Boiler 1.
IP Address: 192.168.1.61 = Boiler 2.
.
.
IP Address: 192.168.1.67 = Boiler 8.
IP Address: 192.168.1.69 = Lead/Lag.
IP Address: 192.168.1.57 = Surge.
IP Address: 192.168.1.58 = Deaerator.
Note: These are the network settings that ware configured to communicate with SCC Inc. devices.

Profinet IO Server Configuration:
These data arrays are for reference only and should not be changed.

Settings (continued)

These are the data array registers that are used to configure your Profinet Server device.

As shown in Figure 1, there are 3 Input Slots and 1 Output Slot. This data corresponds to the Gateway mapping which starts on Page 5 and can be compared to the example on Page 53.

Each RTA protocol gateway needs to have a unique “Device Label”.
Profinet Server 01 = **ps01** = Boiler 1 = 192.168.1.60
Profinet Server 02 = **ps02** = Boiler 2 = 192.168.1.61

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Profinet Server 08 = **ps08** = Boiler 8 = 192.168.1.67
Profinet Server 09 = **ps09** = Lead/Lag = 192.168.1.69
Profinet Server 10 = **ps10** = Deaerator = 192.168.1.58
Profinet Server 11 = **ps11** = Surge = 192.168.1.57

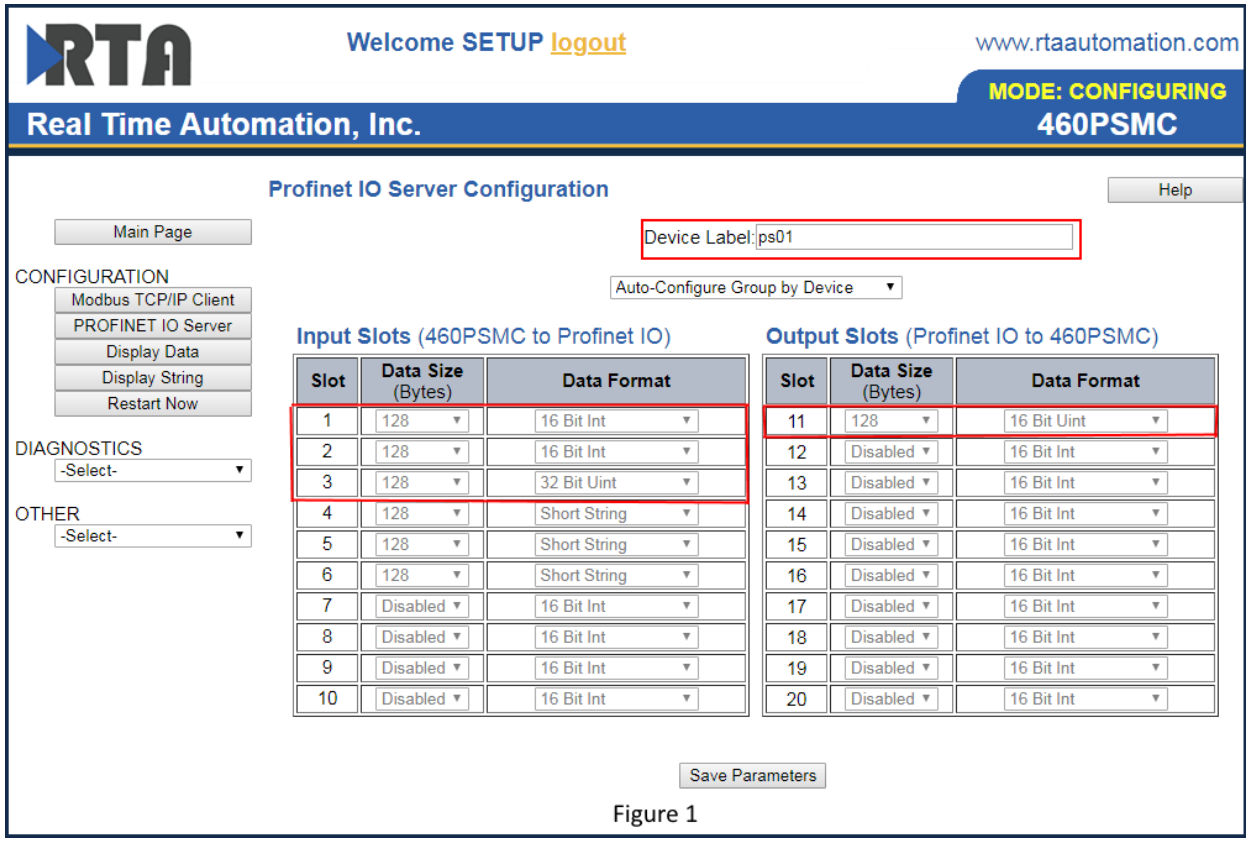

Figure 1

Local Boiler Touchscreen

Gateway - Mapping

ModBus Address	Profinet Address	Access	Description	ModBus Format	Notes
0	IN_Slot1[0]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
1	IN_Slot1[2]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
2	IN_Slot1[4]	R	LMV GAS ACTUATOR	Signed Int 16	x10
3	IN_Slot1[6]	R	LMV OIL ACTUATOR	Signed Int 16	x10
4	IN_Slot1[8]	R	LMV AIR ACTUATOR	Signed Int 16	X10
5	IN_Slot1[10]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
6	IN_Slot1[12]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
7	IN_Slot1[14]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
8	IN_Slot1[16]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
9	IN_Slot1[18]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
10	IN_Slot1[20]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
11	IN_Slot1[22]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
12	IN_Slot1[24]	R	LMV ACTUAL VALUE	Unsigned Int 16	
13	IN_Slot1[26]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
14	IN_Slot1[28]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
15	IN_Slot1[30]	R	LMV CURRENT O_2	Unsigned Int 16	x10
16	IN_Slot1[32]	R	LMV GAS UNIT	Unsigned Int 16	0=metric,1=standard
17	IN_Slot1[34]	R	LMV OIL UNIT	Unsigned Int 16	0=metric,1=standard
18	IN_Slot1[36]	R	LMV TEMPERATURE UNIT	Unsigned Int 16	0=metric,1=standard
19	IN_Slot1[38]	R	LMV PRESSURE UNIT	Unsigned Int 16	0=metric,1=standard
20	IN_Slot1[40]	R	LMV SENSOR SELECTION	Unsigned Int 16	see **Note 2** below
21	IN_Slot3[0]	R	LMV STARTUP COUNTER	Unsigned Int 32	
23	N_Slot3[4]	R	LMV HOUR COUNTER	Unsigned Int 32	
25	IN_Slot1[42]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
26	IN_Slot1[44]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
27	IN_Slot1[46]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	not used
28	IN_Slot1[48]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	see **LMV Phases**
29	IN_Slot1[50]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	

ModBus Address	Profinet Address	Access	Description	ModBus Format	Notes
30	IN_Slot1[52]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
31	IN_Slot1[54]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
32	IN_Slot1[56]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
33	IN_Slot1[58]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
34	IN_Slot1[60]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
35	IN_Slot1[62]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
35 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
35 bit 1		R	LMV FAN CONTACTOR	Boolean	
35 bit 2		R	LMV OIL SELECTED	Boolean	
35 bit 3		R	LMV GAS SELECTED	Boolean	
35 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
35 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
35 bit 7		R	LMV VALVE PROVING SW	Boolean	
35 bit 8		R	LMV SAFETY LOOP	Boolean	
35 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
35 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
35 bit 13		R	LMV AIR PRESSURE SW	Boolean	
35 bit 14		R	LMV START RELEASE OIL	Boolean	
35 bit 15		R	LMV HEAVY OIL START	Boolean	
37	IN_Slot1[64]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
37 bit 0		R	LMV ALARM	Boolean	
37 bit 4		R	LMV IGNITION	Boolean	
37 bit 5		R	LMV START SIGNAL	Boolean	
37 bit 6		R	LMV FAN OUTPUT	Boolean	
37 bit 7		R	LMV OIL PUMP	Boolean	
37 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
37 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	
37 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
37 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
37 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
37 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
37 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
37 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
38*	IN_Slot1[66]	R	LMV PROGRAM STOP	Unsigned Int 16	see **Note 3** below
39*	IN_Slot1[68]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 4** below
40	IN_Slot1[70]	R	LMV MANUAL/AUTOMATIC	Unsigned Int 16	0=auto,1=on,2=off

ModBus Address	Profinet Address	Access	Description	ModBus Format	Notes
41	IN_Slot1[72] OUT_Slot11[0]	R W	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	0=local,1=remote
42*	IN_Slot1[74]	R	LMV MODBUS WATCHDOG	Unsigned Int 16	
43	IN_Slot1[76] OUT_Slot11[2]	R W	LMV MODBUS OPERATING MODE	Unsigned Int 16	0=auto,1=on,2=off
44	IN_Slot1[78] OUT_Slot11[4]	R W	LMV MODBUS SETPOINT W3	Unsigned Int 16	
45	IN_Slot1[80] OUT_Slot11[6]	R W	LMV MODBUS OUTPUT	Unsigned Int 16	x10, see **Note 1** below
46*	IN_Slot1[82]	R	LMV MODBUS FUEL SELECTION	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
47*	IN_Slot1[84]	R	LMV SETPOINT W1	Unsigned Int 16	
48*	IN_Slot1[86]	R	LMV SETPOINT W2	Unsigned Int 16	
49	IN_Slot1[88]	R	LMV WEEKDAY	Unsigned Int 16	0=Sun,1=Mon,…,6=Sat
50	IN_Slot1[90]	R	LMV YEAR 2-DIGIT	Unsigned Int 16	
51	IN_Slot1[92]	R	LMV MONTH	Unsigned Int 16	
52	IN_Slot1[94]	R	LMV DAY	Unsigned Int 16	
53	IN_Slot1[96]	R	LMV HOUR	Unsigned Int 16	
54	IN_Slot1[98]	R	LMV MINUTE	Unsigned Int 16	
55	IN_Slot1[100]	R	LMV SECOND	Unsigned Int 16	
56*	IN_Slot3[8]	R	LMV HOURS RUN GAS RESET	Unsigned Int 32	
58*	IN_Slot3[12]	R	LMV HOURS RUN OIL S1 RESET	Unsigned Int 32	
60*	IN_Slot3[16]	R	LMV HOURS RUN OIL S2 RESET	Unsigned Int 32	
62*	IN_Slot3[20]	R	LMV HOURS RUN OIL S3 RESET	Unsigned Int 32	
64*	I IN_Slot3[24]	R	LMV HOURS RUN TOTAL RESET	Unsigned Int 32	
66	IN_Slot3[28]	R	LMV HOURS RUN TOTAL FIXED	Unsigned Int 32	
68	IN_Slot3[32]	R	LMV HOURS CONNECTED TO POWER	Unsigned Int 32	
70*	IN_Slot3[36]	R	LMV STARTUPS GAS RESET	Unsigned Int 32	
72*	IN_Slot3[40]	R	LMV STARTUPS OIL RESET	Unsigned Int 32	
74*	IN_Slot3[44]	R	LMV STARTUPS TOTAL RESET	Unsigned Int 32	
76	IN_Slot3[48]	R	LMV STARTUPS TOTAL FIXED	Unsigned Int 32	

ModBus Address	Profinet Address	Access	Description	ModBus Format	Notes
78*	IN_Slot3[52]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
80*	IN_Slot3[56]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
82	IN_Slot1[102]	R	LMV NUMBER OF LOCKOUTS	Unsigned Int 16	
83	IN_Slot1[104]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
92	IN_Slot1[106]	R	LMV AZL5 PARAMETER SET CODE	Unsigned Int 16	
93	IN_Slot1[108]	R	LMV AZL5 PARAMETER SET VER	Unsigned Int 16	
94	IN_Slot1[110]	R	LMV AZL5 ID DATE YEAR 2-DIGIT	Unsigned Int 16	
95	IN_Slot1[112]	R	LMV AZL5 ID DATE MONTH	Unsigned Int 16	
96	IN_Slot1[114]	R	LMV AZL5 ID DATE DAY	Unsigned Int 16	
97	IN_Slot1[116]	R	LMV AZL5 ID NUMBER	Unsigned Int 16	
106	IN_Slot1[118]	R	LMV BC PARAMETER SET CODE	Unsigned Int 16	
107	IN_Slot1[120]	R	LMV BC PARAMETER SET VER	Unsigned Int 16	
108	IN_Slot1[122]	R	LMV BC ID DATE YEAR 2-DIGIT	Unsigned Int 16	
109	IN_Slot1[124]	R	LMV BC ID DATE MONTH	Unsigned Int 16	
110	IN_Slot1[126]	R	LMV BURNER CONTROL ID DATE DAY	Unsigned Int 16	
111	IN_Slot2[0]	R	LMV BURNER CONTROL ID NUMBER	Unsigned Int 16	
112	IN_Slot2[2]	R	LMV SOFTWARE VERSION AZL	Unsigned Int 16	read in hexadecimal
113	IN_Slot2[4]	R	LMV SW VER BURNER CONTROL	Unsigned Int 16	read in hexadecimal
114	IN_Slot2[6]	R	LMV SW VER LOAD CONTROL	Unsigned Int 16	read in hexadecimal
123	IN_Slot2[8]	R	LMV MINIMUM OUTPUT GAS	Unsigned Int 16	x10, see **Note 1** below
124	IN_Slot2[10]	R	LMV MAXIMUM OUTPUT GAS	Unsigned Int 16	x10, see **Note 1** below
125	IN_Slot2[12]	R	LMV MINIMUM OUTPUT OIL	Unsigned Int 16	x10, see **Note 1** below
126	IN_Slot2[14]	R	LMV MAXIMUM OUTPUT OIL	Unsigned Int 16	x10, see **Note 1** below
127*	IN_Slot2[16]	R	LMV LOAD LIMIT MODULATING	Unsigned Int 16	x10, see **Note 1** below

ModBus Address	Profinet Address	Access	Description	ModBus Format	Notes
128*	IN_Slot2[18]	R	LMV LOAD LIMIT STAGING	Unsigned Int 16	0=S1,1=S2,2=S3
129	IN_Slot2[20]	R	LMV TEMP LIMIT ON THRESHOLD	Signed Int 16	x10, -50% to 0%
130	IN_Slot2[22]	R	LMV RANGE TEMPERATURE SENSOR	Unsigned Int 16	0=302F,1=752F,2=1562F
131	IN_Slot2[24]	R	LMV ADAPTION ACTIVE	Unsigned Int 16	0=inactive,1=active
132	IN_Slot2[26]	R	LMV ADAPTION STATE	Unsigned Int 16	see **Note 5** below
133	IN_Slot2[28]	R	LMV START ADAPTION	Unsigned Int 16	0=reset,1=start,2=abort
134*	IN_Slot2[30]	R	LMV ADAPTION OUTPUT	Unsigned Int 16	x10
135*	IN_Slot2[32]	R	LMV P-VALUE	Unsigned Int 16	x10
136*	IN_Slot2[34]	R	LMV I-VALUE	Unsigned Int 16	
137*	IN_Slot2[36]	R	LMV D-VALUE	Unsigned Int 16	
140	IN_Slot2[38]	R	OPERATION MODE FUEL 0	Unsigned Int 16	see **Note 8** below
141	IN_Slot2[40]	R	OPERATION MODE FUEL 1	Unsigned Int 16	see **Note 8** below
142	IN_Slot2[42]	R	CYCLES REVERT TO PILOT	Unsigned Int 32	
144	IN_Slot2[44]	R	LOW RANGE TRIM FUEL 0	Signed Int 16	x10
145	IN_Slot2[46]	R	HIGH RANGE TRIM FUEL 0	Signed Int 16	x10
146	IN_Slot2[48]	R	LOW RANGE TRIM FUEL 1	Signed Int 16	x10
147	IN_Slot2[50]	R	HIGH RANGE TRIM FUEL 1	Signed Int 16	x10
148	IN_Slot2[52]	R	ANALOG INPUT TRIM	Signed Int 16	x10
149	IN_Slot2[54]	R	CURRENT TRIM CORRECTION	Signed Int 16	x10
150	IN_Slot2[56]	R	ABSOLUTE SPEED RPM	Unsigned Int 16	
151	IN_Slot2[58]	R	MAINS VOLTAGE	Unsigned Int 16	
158	IN_Slot2[60]	R	EQUIPMENT FAULTS	Unsigned Int 16	word of bits
158 bit 0		R	EQUIPMENT FAULT LMV5	Boolean	
158 bit 1		R	EQUIPMENT FAULT LMV3	Boolean	
158 bit 2		R	EQUIPMENT FAULT RWF10 LC	Boolean	
158 bit 3		R	EQUIPMENT FAULT RWF40 LC	Boolean	
158 bit 4		R	EQUIPMENT FAULT RWF55 LC	Boolean	
158 bit 5		R	EQUIPMENT FAULT RWF40 FW	Boolean	
158 bit 6		R	EQUIPMENT FAULT RWF55 FW	Boolean	

ModBus Address	Profinet Address	Access	Description	ModBus Format	Notes
158 bit 7		R	EQUIPMENT FAULT EA	Boolean	
158 bit 8		R	EQUIPMENT FAULT VSD	Boolean	
200	IN_Slot2[62]	R	LMV5 R40 UNMANIPULATED	Unsigned Int 16	0=auto,1=on,2=off
201	IN_Slot2[64]	R	REMOTE CONTROL HAND-OFF-AUTO	Unsigned Int 16	0=hand,1=off,2=auto
202	IN_Slot2[66]	R	REMOTE CONTROL MANUAL MODE	Unsigned Int 16	0=inactive,1=active
203	IN_Slot2[68]	R	REMOTE CONTROL MANUAL OUTPUT	Unsigned Int 16	x10

Lead/Lag

Gateway - Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
0	IN_Slot1[0] Out_Slot11[0]	R W	LLM REMOTE ENABLE	Unsigned Int 16	0=off,1=enabled
1	IN_Slot1[2] Out_Slot11[2]	R W	LLM REMOTE VALID	Unsigned Int 16	0=invalid,1=valid
2	IN_Slot1[4] Out_Slot11[4]	R W	LLM REMOTE SETPOINT	Unsigned Int 16	
3	IN_Slot1[6]	R	LLM LEAD BOILER	Unsigned Int 16	
4	IN_Slot1[8]	R	LLM ALTERNATION SETPOINT	Unsigned Int 16	
5	IN_Slot1[10]	R	LLM ALT HOURS REMAINING	Unsigned Int 16	
6	IN_Slot1[12]	R	LLM CURRENT SETPOINT	Unsigned Int 16	
7	IN_Slot1[14]	R	LLM TOTAL AVAILABLE	Unsigned Int 16	
8	IN_Slot1[16]	R	LLM ACTUAL VALUE	Unsigned Int 16	
9	IN_Slot1[18]	R	LLM RTD 1	Unsigned Int 16	x10
10	IN_Slot1[20]	R	LLM RTD 2	Unsigned Int 16	x10
11	IN_Slot1[22]	R	LLM RTD 3	Unsigned Int 16	x10
12	IN_Slot1[24]	R	LLM RTD 4	Unsigned Int 16	x10
13	IN_Slot1[26]	R	LLM ANALOG INPUT 1 U16	Unsigned Int 16	x10
14	IN_Slot1[28]	R	LLM ANALOG INPUT 2 U16	Unsigned Int 16	x10
15	IN_Slot1[30]	R	LLM ANALOG INPUT 3 U16	Unsigned Int 16	x10
16	IN_Slot1[32]	R	LLM ANALOG INPUT 4 U16	Unsigned Int 16	x10
17	IN_Slot1[34]	R	LLM EXTRA INPUT	Unsigned Int 16	
26	IN_Slot1[36]	R	LLM LOAD DEMAND	Unsigned Int 16	x10
27	IN_Slot1[38]	R	LLM EXTRA OPTIONS	Unsigned Int 16	
28	IN_Slot7[0]	R	LLM ANALOG INPUT 1 TOTALIZED	Unsigned Int 32	x10
30	IN_Slot7[4]	R	LLM ANALOG INPUT 2 TOTALIZED	Unsigned Int 32	x10
32	IN_Slot7[8]	R	LLM ANALOG INPUT 3 TOTALIZED	Unsigned Int 32	x10
34	IN_Slot7[12]	R	LLM ANALOG INPUT 4 TOTALIZED	Unsigned Int 32	x10
36	IN_Slot1[38]	R	LLM MONITOR OUT 1 U16	Unsigned Int 16	x10

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
37	IN_Slot1[40]	R	LLM MONITOR OUT 2 U16	Unsigned Int 16	x10
38	IN_Slot1[42]	R	LLM MONITOR OUT STATUS	Unsigned Int 16	
38 bit 0		R	LLM MONITOR OUT 3	Boolean	
38 bit 1		R	LLM MONITOR OUT 4	Boolean	
38 bit 2		R	LLM MONITOR OUT 5	Boolean	
38 bit 3		R	LLM MONITOR OUT 6	Boolean	

Lead/Lag Boiler 1

Gateway - Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
100	IN_Slot1[44]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
101	IN_Slot1[46]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
102	IN_Slot1[48]	R	LMV GAS ACTUATOR	Signed Int 16	x10
103	IN_Slot1[50]	R	LMV OIL ACTUATOR	Signed Int 16	x10
104	IN_Slot1[52]	R	LMV AIR ACTUATOR	Signed Int 16	x10
105	IN_Slot1[54]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
106	IN_Slot1[56]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
107	IN_Slot1[58]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
108	IN_Slot1[60]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
109	IN_Slot1[62]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
110	IN_Slot1[64]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
111	IN_Slot1[66]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
112	IN_Slot1[68]	R	LMV ACTUAL VALUE	Unsigned Int 16	
113	IN_Slot1[70]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
114	IN_Slot1[72]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
115	IN_Slot1[74]	R	LMV CURRENT O_2	Unsigned Int 16	x10
116	IN_Slot1[76]	R	BOILER AUTO	Unsigned Int 16	0=no,1=yes
117	IN_Slot1[78]	R	BOILER AVAILABLE	Unsigned Int 16	0=no,1=yes
118	IN_Slot1[80]	R	BOILER PUMP RUNNING	Unsigned Int 16	0=no,1=yes
119	IN_Slot1[82]	R	BOILER PUMP ALARM	Unsigned Int 16	0=no,1=yes

121	IN_Slot7[16]	R	LMV STARTUP COUNTER	Unsigned Int 32	
123	IN_Slot7[20]	R	LMV HOUR COUNTER	Unsigned Int 32	
125	IN_Slot1[84]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
126	IN_Slot1[86]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	
127	IN_Slot1[88]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	
128	IN_Slot1[90]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	
129	IN_Slot1[92]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	
130	IN_Slot1[94]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
131	IN_Slot1[96]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
132	IN_Slot1[98]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
133	IN_Slot1[100]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
134	IN_Slot1[102]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
135	IN_Slot1[104]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
135 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
135 bit 1		R	LMV FAN CONTACTOR	Boolean	
135 bit 2		R	LMV OIL SELECTED	Boolean	
135 bit 3		R	LMV GAS SELECTED	Boolean	
135 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
135 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
135 bit 7		R	LMV VALVE PROVING SW	Boolean	
135 bit 8		R	LMV SAFETY LOOP	Boolean	
135 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
135 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
135 bit 13		R	LMV AIR PRESSURE SW	Boolean	
135 bit 14		R	LMV START RELEASE OIL	Boolean	
135 bit 15		R	LMV HEAVY OIL START	Boolean	

137	IN_Slot1[106]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
137 bit 0		R	LMV ALARM	Boolean	
137 bit 4		R	LMV IGNITION	Boolean	
137 bit 5		R	LMV START SIGNAL	Boolean	
137 bit 6		R	LMV FAN OUTPUT	Boolean	
137 bit 7		R	LMV OIL PUMP	Boolean	
137 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
137 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	
137 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
137 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
137 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
137 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
137 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
137 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
139	IN_Slot1[108]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 2** below
141	IN_Slot1[110]	R	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	
143	IN_Slot1[112]	R	LMV MODBUS OPERATING MODE	Unsigned Int 16	
144	IN_Slot1[114]	R	LMV MODBUS SETPOINT W3	Unsigned Int 16	
145	IN_Slot1[116]	R	LMV MODBUS OUTPUT	Unsigned Int 16	
147	IN_Slot1[118]	R	LMV SETPOINT W1	Unsigned Int 16	
148	IN_Slot1[120]	R	LMV SETPOINT W2	Unsigned Int 16	
158	IN_Slot7[24]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
160	IN_Slot7[28]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
162	IN_Slot1[122]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
163	IN_Slot1[124]	R	FEEDWATER E1 U16	Signed Int 16	x10
164	IN_Slot1[126]	R	FEEDWATER E2 U16	Unsigned Int 16	x10
165	IN_Slot2[0]	R	FEEDWATER WR CURRENT SP U16	Signed Int 16	x10
166	IN_Slot2[2]	R	FEEDWATER SP1 U16	Signed Int 16	x10
167	IN_Slot2[4]	R	EA DRAFT SENSOR	Signed Int 16	x100
168	IN_Slot2[6]	R	EA DRAFT FEEDBACK	Unsigned Int 16	x10

186	IN_Slot2[8]	R	EA STATUS WORD	Unsigned Int 16	
186 bit 0		R	EA INPUT 1	Boolean	
186 bit 1		R	EA INPUT 2	Boolean	
186 bit 2		R	EA INPUT 3	Boolean	
186 bit 3		R	EA INPUT 4	Boolean	
186 bit 4		R	EA INPUT 5	Boolean	
186 bit 5		R	EA INPUT 6	Boolean	
186 bit 6		R	EA INPUT 7	Boolean	
186 bit 7		R	EA INPUT 8	Boolean	
186 bit 8		R	EA INPUT 9	Boolean	
186 bit 9		R	EA INPUT 10	Boolean	
186 bit 10		R	EA INPUT 11	Boolean	
186 bit 11		R	EA INPUT 12	Boolean	
186 bit 12		R	EA INPUT 13	Boolean	
187	IN_Slot2[10]	R	EA ALARM WORD	Unsigned Int 16	
187 bit 0		R	EA ALARM INPUT 1	Boolean	
187 bit 1		R	EA ALARM INPUT 2	Boolean	
187 bit 2		R	EA ALARM INPUT 3	Boolean	
187 bit 3		R	EA ALARM INPUT 4	Boolean	
187 bit 4		R	EA ALARM INPUT 5	Boolean	
187 bit 5		R	EA ALARM INPUT 6	Boolean	
187 bit 6		R	EA ALARM INPUT 7	Boolean	
187 bit 7		R	EA ALARM INPUT 8	Boolean	
187 bit 8		R	EA ALARM INPUT 9	Boolean	
187 bit 9		R	EA ALARM INPUT 10	Boolean	
187 bit 10		R	EA ALARM INPUT 11	Boolean	
187 bit 11		R	EA ALARM INPUT 12	Boolean	
187 bit 12		R	EA ALARM INPUT 13	Boolean	
188	IN_Slot2[12]	R	EA RTD 1	Signed Int 16	x10
189	IN_Slot2[14]	R	EA RTD 2	Signed Int 16	x10
190	IN_Slot2[16]	R	EA RTD 3	Signed Int 16	x10
191	IN_Slot2[18]	R	EA RTD 4	Signed Int 16	x10
192	IN_Slot2[20]	R	EA ANALOG INPUT 1 U16	Signed Int 16	x10
193	IN_Slot2[22]	R	EA ANALOG INPUT 2 U16	Signed Int 16	x10
194	IN_Slot2[24]	R	EA ANALOG INPUT 3 U16	Signed Int 16	x10
195	IN_Slot2[26]	R	EA ANALOG INPUT 4 U16	Signed Int 16	x10
196	IN_Slot2[28]	R	EA ECONOMIZER WATER IN	Unsigned Int 16	x10
197	IN_Slot2[30]	R	EA ECONOMIZER WATER OUT	Unsigned Int 16	x10

198	IN_Slot2[32]	R	EA ECONOMIZER STACK IN	Unsigned Int 16	x10
199	IN_Slot2[34]	R	EA ECONOMIZER STACK OUT	Unsigned Int 16	x10

Lead/Lag Boiler 2

Gateway - Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
200	IN_Slot2[36]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
201	IN_Slot2[38]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
202	IN_Slot2[40]	R	LMV GAS ACTUATOR	Signed Int 16	x10
203	IN_Slot2[42]	R	LMV OIL ACTUATOR	Signed Int 16	x10
204	IN_Slot2[44]	R	LMV AIR ACTUATOR	Signed Int 16	x10
205	IN_Slot2[46]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
206	IN_Slot2[48]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
207	IN_Slot2[50]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
208	IN_Slot2[52]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
209	IN_Slot2[54]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
210	IN_Slot2[56]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
211	IN_Slot2[58]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
212	IN_Slot2[60]	R	LMV ACTUAL VALUE	Unsigned Int 16	
213	IN_Slot2[62]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
214	IN_Slot2[64]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
215	IN_Slot2[66]	R	LMV CURRENT O_2	Unsigned Int 16	x10
216	IN_Slot2[68]	R	BOILER AUTO	Unsigned Int 16	0=no,1=yes
217	IN_Slot2[70]	R	BOILER AVAILABLE	Unsigned Int 16	0=no,1=yes
218	IN_Slot2[72]	R	BOILER PUMP RUNNING	Unsigned Int 16	0=no,1=yes
219	IN_Slot2[74]	R	BOILER PUMP ALARM	Unsigned Int 16	0=no,1=yes
221	IN_Slot7[32]	R	LMV STARTUP COUNTER	Unsigned Int 32	
223	IN_Slot7[36]	R	LMV HOUR COUNTER	Unsigned Int 32	
225	IN_Slot2[76]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
226	IN_Slot2[78]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	
227	IN_Slot2[80]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	

228	IN_Slot2[82]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	
229	IN_Slot2[84]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	
230	IN_Slot2[86]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
231	IN_Slot2[88]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
232	IN_Slot2[90]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
233	IN_Slot2[92]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
234	IN_Slot2[94]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
235	IN_Slot2[96]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
235 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
235 bit 1		R	LMV FAN CONTACTOR	Boolean	
235 bit 2		R	LMV OIL SELECTED	Boolean	
235 bit 3		R	LMV GAS SELECTED	Boolean	
235 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
235 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
235 bit 7		R	LMV VALVE PROVING SW	Boolean	
235 bit 8		R	LMV SAFETY LOOP	Boolean	
235 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
235 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
235 bit 13		R	LMV AIR PRESSURE SW	Boolean	
235 bit 14		R	LMV START RELEASE OIL	Boolean	
235 bit 15		R	LMV HEAVY OIL START	Boolean	
237	IN_Slot2[98]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
237 bit 0		R	LMV ALARM	Boolean	
237 bit 4		R	LMV IGNITION	Boolean	
237 bit 5		R	LMV START SIGNAL	Boolean	
237 bit 6		R	LMV FAN OUTPUT	Boolean	
237 bit 7		R	LMV OIL PUMP	Boolean	
237 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
237 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	

237 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
237 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
237 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
237 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
237 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
237 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
239	IN_Slot2[100]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 2** below
241	IN_Slot2[102]	R	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	
243	IN_Slot2[104]	R	LMV MODBUS OPERATING MODE	Unsigned Int 16	
244	IN_Slot2[106]	R	LMV MODBUS SETPOINT W3	Unsigned Int 16	
245	IN_Slot2[108]	R	LMV MODBUS OUTPUT	Unsigned Int 16	
247	IN_Slot2[110]	R	LMV SETPOINT W1	Unsigned Int 16	
248	IN_Slot2[112]	R	LMV SETPOINT W2	Unsigned Int 16	
258	IN_Slot7[40]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
260	IN_Slot7[44]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
262	IN_Slot2[122]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
263	IN_Slot2[124]	R	FEEDWATER E1 U16	Signed Int 16	x10
64	IN_Slot2[126]	R	FEEDWATER E2 U16	Unsigned Int 16	x10
265	IN_Slot2[120]	R	FEEDWATER WR CURRENT SP U16	Signed Int 16	x10
266	IN_Slot2[122]	R	FEEDWATER SP1 U16	Signed Int 16	x10
267	IN_Slot2[124]	R	EA DRAFT SENSOR	Signed Int 16	x100
268	IN_Slot2[126]	R	EA DRAFT FEEDBACK	Unsigned Int 16	x10
286	IN_Slot3[0]	R	EA STATUS WORD	Unsigned Int 16	
286 bit 0		R	EA INPUT 1	Boolean	
286 bit 1		R	EA INPUT 2	Boolean	
286 bit 2		R	EA INPUT 3	Boolean	
286 bit 3		R	EA INPUT 4	Boolean	
286 bit 4		R	EA INPUT 5	Boolean	
286 bit 5		R	EA INPUT 6	Boolean	
286 bit 6		R	EA INPUT 7	Boolean	

286 bit 7		R	EA INPUT 8	Boolean	
286 bit 8		R	EA INPUT 9	Boolean	
286 bit 9		R	EA INPUT 10	Boolean	
286 bit 10		R	EA INPUT 11	Boolean	
286 bit 11		R	EA INPUT 12	Boolean	
286 bit 12		R	EA INPUT 13	Boolean	
287	IN_Slot3[2]	R	EA ALARM WORD	Unsigned Int 16	
287 bit 0		R	EA ALARM INPUT 1	Boolean	
287 bit 1		R	EA ALARM INPUT 2	Boolean	
287 bit 2		R	EA ALARM INPUT 3	Boolean	
287 bit 3		R	EA ALARM INPUT 4	Boolean	
287 bit 4		R	EA ALARM INPUT 5	Boolean	
287 bit 5		R	EA ALARM INPUT 6	Boolean	
287 bit 6		R	EA ALARM INPUT 7	Boolean	
287 bit 7		R	EA ALARM INPUT 8	Boolean	
287 bit 8		R	EA ALARM INPUT 9	Boolean	
287 bit 9		R	EA ALARM INPUT 10	Boolean	
287 bit 10		R	EA ALARM INPUT 11	Boolean	
287 bit 11		R	EA ALARM INPUT 12	Boolean	
287 bit 12		R	EA ALARM INPUT 13	Boolean	
288	IN_Slot3[4]	R	EA RTD 1	Signed Int 16	x10
289	IN_Slot3[6]	R	EA RTD 2	Signed Int 16	x10
290	IN_Slot3[8]	R	EA RTD 3	Signed Int 16	x10
291	IN_Slot3[10]	R	EA RTD 4	Signed Int 16	x10
292	IN_Slot3[12]	R	EA ANALOG INPUT 1 U16	Signed Int 16	x10
293	IN_Slot3[14]	R	EA ANALOG INPUT 2 U16	Signed Int 16	x10
294	IN_Slot3[16]	R	EA ANALOG INPUT 3 U16	Signed Int 16	x10
295	IN_Slot3[18]	R	EA ANALOG INPUT 4 U16	Signed Int 16	x10
296	IN_Slot3[20]	R	EA ECONOMIZER WATER IN	Unsigned Int 16	x10
297	IN_Slot3[22]	R	EA ECONOMIZER WATER OUT	Unsigned Int 16	x10
298	IN_Slot3[24]	R	EA ECONOMIZER STACK IN	Unsigned Int 16	x10
299	IN_Slot3[26]	R	EA ECONOMIZER STACK OUT	Unsigned Int 16	x10

Lead/Lag Boiler 3

Gateway – Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
300	IN_Slot3[28]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
301	IN_Slot3[30]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
302	IN_Slot3[32]	R	LMV GAS ACTUATOR	Signed Int 16	x10
303	IN_Slot3[34]	R	LMV OIL ACTUATOR	Signed Int 16	x10
304	IN_Slot3[36]	R	LMV AIR ACTUATOR	Signed Int 16	x10
305	IN_Slot3[38]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
306	IN_Slot3[40]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
307	IN_Slot3[42]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
308	IN_Slot3[44]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
309	IN_Slot3[46]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
310	IN_Slot3[48]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
311	IN_Slot3[50]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
312	IN_Slot3[52]	R	LMV ACTUAL VALUE	Unsigned Int 16	
313	IN_Slot3[54]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
314	IN_Slot3[56]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
315	IN_Slot3[58]	R	LMV CURRENT O_2	Unsigned Int 16	x10
316	IN_Slot3[60]	R	BOILER AUTO	Unsigned Int 16	0=no,1=yes
317	IN_Slot3[62]	R	BOILER AVAILABLE	Unsigned Int 16	0=no,1=yes
318	IN_Slot3[64]	R	BOILER PUMP RUNNING	Unsigned Int 16	0=no,1=yes
319	IN_Slot3[66]	R	BOILER PUMP ALARM	Unsigned Int 16	0=no,1=yes
321	IN_Slot7[48]	R	LMV STARTUP COUNTER	Unsigned Int 32	
323	IN_Slot7[52]	R	LMV HOUR COUNTER	Unsigned Int 32	
325	IN_Slot3[68]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
326	IN_Slot3[70]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	
327	IN_Slot3[72]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	

328	IN_Slot3[74]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	
329	IN_Slot3[76]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	
330	IN_Slot3[78]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
331	IN_Slot3[80]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
332	IN_Slot3[82]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
333	IN_Slot3[84]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
334	IN_Slot3[86]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
335	IN_Slot3[88]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
335 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
335 bit 1		R	LMV FAN CONTACTOR	Boolean	
335 bit 2		R	LMV OIL SELECTED	Boolean	
335 bit 3		R	LMV GAS SELECTED	Boolean	
335 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
335 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
335 bit 7		R	LMV VALVE PROVING SW	Boolean	
335 bit 8		R	LMV SAFETY LOOP	Boolean	
335 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
335 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
335 bit 13		R	LMV AIR PRESSURE SW	Boolean	
335 bit 14		R	LMV START RELEASE OIL	Boolean	
335 bit 15		R	LMV HEAVY OIL START	Boolean	
337	IN_Slot3[90]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
337 bit 0		R	LMV ALARM	Boolean	
337 bit 4		R	LMV IGNITION	Boolean	
337 bit 5		R	LMV START SIGNAL	Boolean	
337 bit 6		R	LMV FAN OUTPUT	Boolean	
337 bit 7		R	LMV OIL PUMP	Boolean	
337 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
337 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	

337 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
337 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
337 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
337 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
337 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
337 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
339	IN_Slot3[92]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 2** below
341	IN_Slot3[94]	R	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	
343	IN_Slot3[96]	R	LMV MODBUS OPERATING MODE	Unsigned Int 16	
344	IN_Slot3[98]	R	LMV MODBUS SETPOINT W3	Unsigned Int 16	
345	IN_Slot3[100]	R	LMV MODBUS OUTPUT	Unsigned Int 16	
347	IN_Slot3[102]	R	LMV SETPOINT W1	Unsigned Int 16	
348	IN_Slot3[104]	R	LMV SETPOINT W2	Unsigned Int 16	
358	IN_Slot7[56]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
360	IN_Slot7[60]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
362	IN_Slot3[106]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
363	IN_Slot3[108]	R	FEEDWATER E1 U16	Signed Int 16	x10
364	IN_Slot3[110]	R	FEEDWATER E2 U16	Unsigned Int 16	x10
365	IN_Slot3[112]	R	FEEDWATER WR CURRENT SP U16	Signed Int 16	x10
366	IN_Slot3[114]	R	FEEDWATER SP1 U16	Signed Int 16	x10
367	IN_Slot3[116]	R	EA DRAFT SENSOR	Signed Int 16	x100
368	IN_Slot3[118]	R	EA DRAFT FEEDBACK	Unsigned Int 16	x10
386	IN_Slot3[120]	R	EA STATUS WORD	Unsigned Int 16	
386 bit 0		R	EA INPUT 1	Boolean	
386 bit 1		R	EA INPUT 2	Boolean	
386 bit 2		R	EA INPUT 3	Boolean	
386 bit 3		R	EA INPUT 4	Boolean	
386 bit 4		R	EA INPUT 5	Boolean	
386 bit 5		R	EA INPUT 6	Boolean	
386 bit 6		R	EA INPUT 7	Boolean	

386 bit 7		R	EA INPUT 8	Boolean	
386 bit 8		R	EA INPUT 9	Boolean	
386 bit 9		R	EA INPUT 10	Boolean	
386 bit 10		R	EA INPUT 11	Boolean	
386 bit 11		R	EA INPUT 12	Boolean	
386 bit 12		R	EA INPUT 13	Boolean	
387	IN_Slot3[122]	R	EA ALARM WORD	Unsigned Int 16	
387 bit 0		R	EA ALARM INPUT 1	Boolean	
387 bit 1		R	EA ALARM INPUT 2	Boolean	
387 bit 2		R	EA ALARM INPUT 3	Boolean	
387 bit 3		R	EA ALARM INPUT 4	Boolean	
387 bit 4		R	EA ALARM INPUT 5	Boolean	
387 bit 5		R	EA ALARM INPUT 6	Boolean	
387 bit 6		R	EA ALARM INPUT 7	Boolean	
387 bit 7		R	EA ALARM INPUT 8	Boolean	
387 bit 8		R	EA ALARM INPUT 9	Boolean	
387 bit 9		R	EA ALARM INPUT 10	Boolean	
387 bit 10		R	EA ALARM INPUT 11	Boolean	
387 bit 11		R	EA ALARM INPUT 12	Boolean	
387 bit 12		R	EA ALARM INPUT 13	Boolean	
388	IN_Slot3[124]	R	EA RTD 1	Signed Int 16	x10
389	IN_Slot3[126]	R	EA RTD 2	Signed Int 16	x10
390	IN_Slot4[0]	R	EA RTD 3	Signed Int 16	x10
391	IN_Slot4[2]	R	EA RTD 4	Signed Int 16	x10
392	IN_Slot4[4]	R	EA ANALOG INPUT 1 U16	Signed Int 16	x10
393	IN_Slot4[6]	R	EA ANALOG INPUT 2 U16	Signed Int 16	x10
394	IN_Slot4[8]	R	EA ANALOG INPUT 3 U16	Signed Int 16	x10
395	IN_Slot4[10]	R	EA ANALOG INPUT 4 U16	Signed Int 16	x10
396	IN_Slot4[12]	R	EA ECONOMIZER WATER IN	Unsigned Int 16	x10
397	IN_Slot4[14]	R	EA ECONOMIZER WATER OUT	Unsigned Int 16	x10
398	IN_Slot4[16]	R	EA ECONOMIZER STACK IN	Unsigned Int 16	x10
399	IN_Slot4[18]	R	EA ECONOMIZER STACK OUT	Unsigned Int 16	x10

Lead/Lag Boiler 4

Gateway – Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
400	IN_Slot4[20]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
401	IN_Slot4[22]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
402	IN_Slot4[24]	R	LMV GAS ACTUATOR	Signed Int 16	x10
403	IN_Slot4[26]	R	LMV OIL ACTUATOR	Signed Int 16	x10
404	IN_Slot4[28]	R	LMV AIR ACTUATOR	Signed Int 16	x10
405	IN_Slot4[30]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
406	IN_Slot4[32]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
407	IN_Slot4[34]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
408	IN_Slot4[36]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
409	IN_Slot4[38]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
410	IN_Slot4[40]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
411	IN_Slot4[42]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
412	IN_Slot4[44]	R	LMV ACTUAL VALUE	Unsigned Int 16	
413	IN_Slot4[46]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
414	IN_Slot4[48]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
415	IN_Slot4[50]	R	LMV CURRENT O_2	Unsigned Int 16	x10
416	IN_Slot4[52]	R	BOILER AUTO	Unsigned Int 16	0=no,1=yes
417	IN_Slot4[54]	R	BOILER AVAILABLE	Unsigned Int 16	0=no,1=yes
418	IN_Slot4[56]	R	BOILER PUMP RUNNING	Unsigned Int 16	0=no,1=yes
419	IN_Slot4[58]	R	BOILER PUMP ALARM	Unsigned Int 16	0=no,1=yes
421	IN_Slot7[64]	R	LMV STARTUP COUNTER	Unsigned Int 32	
423	IN_Slot7[68]	R	LMV HOUR COUNTER	Unsigned Int 32	
425	IN_Slot4[60]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
426	IN_Slot4[62]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	
427	IN_Slot4[64]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	

428	IN_Slot4[66]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	
429	IN_Slot4[68]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	
430	IN_Slot4[70]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
431	IN_Slot4[72]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
432	IN_Slot4[74]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
433	IN_Slot4[76]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
434	IN_Slot4[78]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
435	IN_Slot4[80]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
435 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
435 bit 1		R	LMV FAN CONTACTOR	Boolean	
435 bit 2		R	LMV OIL SELECTED	Boolean	
435 bit 3		R	LMV GAS SELECTED	Boolean	
435 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
435 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
435 bit 7		R	LMV VALVE PROVING SW	Boolean	
435 bit 8		R	LMV SAFETY LOOP	Boolean	
435 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
435 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
435 bit 13		R	LMV AIR PRESSURE SW	Boolean	
435 bit 14		R	LMV START RELEASE OIL	Boolean	
435 bit 15		R	LMV HEAVY OIL START	Boolean	
437	IN_Slot4[82]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
437 bit 0		R	LMV ALARM	Boolean	
437 bit 4		R	LMV IGNITION	Boolean	
437 bit 5		R	LMV START SIGNAL	Boolean	
437 bit 6		R	LMV FAN OUTPUT	Boolean	
437 bit 7		R	LMV OIL PUMP	Boolean	
437 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
437 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	

437 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
437 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
437 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
437 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
437 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
437 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
439	IN_Slot4[84]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 2** below
441	IN_Slot4[86]	R	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	
443	IN_Slot4[88]	R	LMV MODBUS OPERATING MODE	Unsigned Int 16	
444	IN_Slot4[90]	R	LMV MODBUS SETPOINT W3	Unsigned Int 16	
445	IN_Slot4[92]	R	LMV MODBUS OUTPUT	Unsigned Int 16	
447	IN_Slot4[94]	R	LMV SETPOINT W1	Unsigned Int 16	
448	IN_Slot4[96]	R	LMV SETPOINT W2	Unsigned Int 16	
458	IN_Slot7[72]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
460	IN_Slot7[76]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
462	IN_Slot4[98]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
463	IN_Slot4[100]	R	FEEDWATER E1 U16	Signed Int 16	x10
464	IN_Slot4[102]	R	FEEDWATER E2 U16	Unsigned Int 16	x10
465	IN_Slot4[104]	R	FEEDWATER WR CURRENT SP U16	Signed Int 16	x10
466	IN_Slot4[106]	R	FEEDWATER SP1 U16	Signed Int 16	x10
467	IN_Slot4[108]	R	EA DRAFT SENSOR	Signed Int 16	x100
468	IN_Slot4[110]	R	EA DRAFT FEEDBACK	Unsigned Int 16	x10
486	IN_Slot4[112]	R	EA STATUS WORD	Unsigned Int 16	
486 bit 0		R	EA INPUT 1	Boolean	
486 bit 1		R	EA INPUT 2	Boolean	
486 bit 2		R	EA INPUT 3	Boolean	
486 bit 3		R	EA INPUT 4	Boolean	
486 bit 4		R	EA INPUT 5	Boolean	
486 bit 5		R	EA INPUT 6	Boolean	
486 bit 6		R	EA INPUT 7	Boolean	

486 bit 7		R	EA INPUT 8	Boolean	
486 bit 8		R	EA INPUT 9	Boolean	
486 bit 9		R	EA INPUT 10	Boolean	
486 bit 10		R	EA INPUT 11	Boolean	
486 bit 11		R	EA INPUT 12	Boolean	
486 bit 12		R	EA INPUT 13	Boolean	
487	IN_Slot4[114]	R	EA ALARM WORD	Unsigned Int 16	
487 bit 0		R	EA ALARM INPUT 1	Boolean	
487 bit 1		R	EA ALARM INPUT 2	Boolean	
487 bit 2		R	EA ALARM INPUT 3	Boolean	
487 bit 3		R	EA ALARM INPUT 4	Boolean	
487 bit 4		R	EA ALARM INPUT 5	Boolean	
487 bit 5		R	EA ALARM INPUT 6	Boolean	
487 bit 6		R	EA ALARM INPUT 7	Boolean	
487 bit 7		R	EA ALARM INPUT 8	Boolean	
487 bit 8		R	EA ALARM INPUT 9	Boolean	
487 bit 9		R	EA ALARM INPUT 10	Boolean	
487 bit 10		R	EA ALARM INPUT 11	Boolean	
487 bit 11		R	EA ALARM INPUT 12	Boolean	
487 bit 12		R	EA ALARM INPUT 13	Boolean	
488	IN_Slot4[116]	R	EA RTD 1	Signed Int 16	x10
489	IN_Slot4[118]	R	EA RTD 2	Signed Int 16	x10
490	IN_Slot4[120]	R	EA RTD 3	Signed Int 16	x10
491	IN_Slot4[122]	R	EA RTD 4	Signed Int 16	x10
492	IN_Slot4[124]	R	EA ANALOG INPUT 1 U16	Signed Int 16	x10
493	IN_Slot4[126]	R	EA ANALOG INPUT 2 U16	Signed Int 16	x10
494	IN_Slot5[0]	R	EA ANALOG INPUT 3 U16	Signed Int 16	x10
495	IN_Slot5[2]	R	EA ANALOG INPUT 4 U16	Signed Int 16	x10
496	IN_Slot5[4]	R	EA ECONOMIZER WATER IN	Unsigned Int 16	x10
497	IN_Slot5[6]	R	EA ECONOMIZER WATER OUT	Unsigned Int 16	x10
498	IN_Slot5[8]	R	EA ECONOMIZER STACK IN	Unsigned Int 16	x10
499	IN_Slot5[10]	R	EA ECONOMIZER STACK OUT	Unsigned Int 16	x10

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Gateway – Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
500	IN_Slot5[12]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
501	IN_Slot5[14]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
502	IN_Slot5[16]	R	LMV GAS ACTUATOR	Signed Int 16	x10
503	IN_Slot5[18]	R	LMV OIL ACTUATOR	Signed Int 16	x10
504	IN_Slot5[20]	R	LMV AIR ACTUATOR	Signed Int 16	x10
505	IN_Slot5[22]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
506	IN_Slot5[24]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
507	IN_Slot5[26]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
508	IN_Slot5[28]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
509	IN_Slot5[30]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
510	IN_Slot5[32]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
511	IN_Slot5[34]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
512	IN_Slot5[36]	R	LMV ACTUAL VALUE	Unsigned Int 16	
513	IN_Slot5[38]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
514	IN_Slot5[40]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
515	IN_Slot5[42]	R	LMV CURRENT O_2	Unsigned Int 16	x10
516	IN_Slot5[44]	R	BOILER AUTO	Unsigned Int 16	0=no,1=yes
517	IN_Slot5[46]	R	BOILER AVAILABLE	Unsigned Int 16	0=no,1=yes
518	IN_Slot5[48]	R	BOILER PUMP RUNNING	Unsigned Int 16	0=no,1=yes
519	IN_Slot5[50]	R	BOILER PUMP ALARM	Unsigned Int 16	0=no,1=yes
521	IN_Slot7[80]	R	LMV STARTUP COUNTER	Unsigned Int 32	
523	IN_Slot7[84]	R	LMV HOUR COUNTER	Unsigned Int 32	
525	IN_Slot5[52]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
526	IN_Slot5[54]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	
527	IN_Slot5[56]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	

528	IN_Slot5[58]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	
529	IN_Slot5[60]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	
530	IN_Slot5[62]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
531	IN_Slot5[64]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
532	IN_Slot5[66]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
533	IN_Slot5[68]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
534	IN_Slot5[70]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
535	IN_Slot5[72]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
535 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
535 bit 1		R	LMV FAN CONTACTOR	Boolean	
535 bit 2		R	LMV OIL SELECTED	Boolean	
535 bit 3		R	LMV GAS SELECTED	Boolean	
535 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
535 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
535 bit 7		R	LMV VALVE PROVING SW	Boolean	
535 bit 8		R	LMV SAFETY LOOP	Boolean	
535 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
535 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
535 bit 13		R	LMV AIR PRESSURE SW	Boolean	
535 bit 14		R	LMV START RELEASE OIL	Boolean	
535 bit 15		R	LMV HEAVY OIL START	Boolean	
537	IN_Slot5[74]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
537 bit 0		R	LMV ALARM	Boolean	
537 bit 4		R	LMV IGNITION	Boolean	
537 bit 5		R	LMV START SIGNAL	Boolean	
537 bit 6		R	LMV FAN OUTPUT	Boolean	
537 bit 7		R	LMV OIL PUMP	Boolean	
537 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
537 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	

537 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
537 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
537 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
537 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
537 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
537 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
539	IN_Slot5[76]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 2** below
541	IN_Slot5[78]	R	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	
543	IN_Slot5[80]	R	LMV MODBUS OPERATING MODE	Unsigned Int 16	
544	IN_Slot5[82]	R	LMV MODBUS SETPOINT W3	Unsigned Int 16	
545	IN_Slot5[84]	R	LMV MODBUS OUTPUT	Unsigned Int 16	
547	IN_Slot5[86]	R	LMV SETPOINT W1	Unsigned Int 16	
548	IN_Slot5[88]	R	LMV SETPOINT W2	Unsigned Int 16	
558	IN_Slot7[88]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
560	IN_Slot7[92]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
562	IN_Slot5[90]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
563	IN_Slot5[92]	R	FEEDWATER E1 U16	Signed Int 16	x10
564	IN_Slot5[94]	R	FEEDWATER E2 U16	Unsigned Int 16	x10
565	IN_Slot5[96]	R	FEEDWATER WR CURRENT SP U16	Signed Int 16	x10
566	IN_Slot5[98]	R	FEEDWATER SP1 U16	Signed Int 16	x10
567	IN_Slot5[100]	R	EA DRAFT SENSOR	Signed Int 16	x100
568	IN_Slot5[102]	R	EA DRAFT FEEDBACK	Unsigned Int 16	x10
586	IN_Slot5[104]	R	EA STATUS WORD	Unsigned Int 16	
586 bit 0		R	EA INPUT 1	Boolean	
586 bit 1		R	EA INPUT 2	Boolean	
586 bit 2		R	EA INPUT 3	Boolean	
586 bit 3		R	EA INPUT 4	Boolean	
586 bit 4		R	EA INPUT 5	Boolean	
586 bit 5		R	EA INPUT 6	Boolean	
586 bit 6		R	EA INPUT 7	Boolean	

586 bit 7		R	EA INPUT 8	Boolean	
586 bit 8		R	EA INPUT 9	Boolean	
586 bit 9		R	EA INPUT 10	Boolean	
586 bit 10		R	EA INPUT 11	Boolean	
586 bit 11		R	EA INPUT 12	Boolean	
586 bit 12		R	EA INPUT 13	Boolean	
587	IN_Slot5[106]	R	EA ALARM WORD	Unsigned Int 16	
587 bit 0		R	EA ALARM INPUT 1	Boolean	
587 bit 1		R	EA ALARM INPUT 2	Boolean	
587 bit 2		R	EA ALARM INPUT 3	Boolean	
587 bit 3		R	EA ALARM INPUT 4	Boolean	
587 bit 4		R	EA ALARM INPUT 5	Boolean	
587 bit 5		R	EA ALARM INPUT 6	Boolean	
587 bit 6		R	EA ALARM INPUT 7	Boolean	
587 bit 7		R	EA ALARM INPUT 8	Boolean	
587 bit 8		R	EA ALARM INPUT 9	Boolean	
587 bit 9		R	EA ALARM INPUT 10	Boolean	
587 bit 10		R	EA ALARM INPUT 11	Boolean	
587 bit 11		R	EA ALARM INPUT 12	Boolean	
587 bit 12		R	EA ALARM INPUT 13	Boolean	
588	IN_Slot5[108]	R	EA RTD 1	Signed Int 16	x10
589	IN_Slot5[110]	R	EA RTD 2	Signed Int 16	x10
590	IN_Slot5[112]	R	EA RTD 3	Signed Int 16	x10
591	IN_Slot5[114]	R	EA RTD 4	Signed Int 16	x10
592	IN_Slot5[116]	R	EA ANALOG INPUT 1 U16	Signed Int 16	x10
593	IN_Slot5[118]	R	EA ANALOG INPUT 2 U16	Signed Int 16	x10
594	IN_Slot5[120]	R	EA ANALOG INPUT 3 U16	Signed Int 16	x10
595	IN_Slot5[122]	R	EA ANALOG INPUT 4 U16	Signed Int 16	x10
596	IN_Slot5[124]	R	EA ECONOMIZER WATER IN	Unsigned Int 16	x10
597	IN_Slot5[126]	R	EA ECONOMIZER WATER OUT	Unsigned Int 16	x10
598	IN_Slot6[0]	R	EA ECONOMIZER STACK IN	Unsigned Int 16	x10
599	IN_Slot6[2]	R	EA ECONOMIZER STACK OUT	Unsigned Int 16	x10

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Gateway – Mapping

Modbus ADDRESS	Profinet Address	ACCESS	DESCRIPTION	Modbus FORMAT	NOTES
600	IN_Slot6[4]	R	LMV PHASE	Unsigned Int 16	see **LMV Phases**
601	IN_Slot6[6]	R	LMV FUEL ACTUATOR	Signed Int 16	x10
602	IN_Slot6[8]	R	LMV GAS ACTUATOR	Signed Int 16	x10
603	IN_Slot6[10]	R	LMV OIL ACTUATOR	Signed Int 16	x10
604	IN_Slot6[12]	R	LMV AIR ACTUATOR	Signed Int 16	x10
605	IN_Slot6[14]	R	LMV AUX1 ACTUATOR	Signed Int 16	x10
606	IN_Slot6[16]	R	LMV AUX2 ACTUATOR	Signed Int 16	x10
607	IN_Slot6[18]	R	LMV AUX3 ACTUATOR	Signed Int 16	x10
608	IN_Slot6[20]	R	LMV VSD OUTPUT	Unsigned Int 16	x10
609	IN_Slot6[22]	R	LMV CURRENT FUEL	Unsigned Int 16	0=gas/fuel0,1=oil/fuel1
610	IN_Slot6[24]	R	LMV CURRENT OUTPUT	Unsigned Int 16	x10, see **Note 1** below
611	IN_Slot6[26]	R	LMV CURRENT SETPOINT	Unsigned Int 16	
612	IN_Slot6[28]	R	LMV ACTUAL VALUE	Unsigned Int 16	
613	IN_Slot6[30]	R	LMV FLAME SIGNAL	Unsigned Int 16	x10
614	IN_Slot6[32]	R	LMV FUEL THROUGHPUT	Unsigned Int 16	
615	IN_Slot6[34]	R	LMV CURRENT O_2	Unsigned Int 16	x10
616	IN_Slot6[36]	R	BOILER AUTO	Unsigned Int 16	0=no,1=yes
617	IN_Slot6[38]	R	BOILER AVAILABLE	Unsigned Int 16	0=no,1=yes
618	IN_Slot6[40]	R	BOILER PUMP RUNNING	Unsigned Int 16	0=no,1=yes
619	IN_Slot6[42]	R	BOILER PUMP ALARM	Unsigned Int 16	0=no,1=yes
621	IN_Slot7[96]	R	LMV STARTUP COUNTER	Unsigned Int 32	
623	IN_Slot7[100]	R	LMV HOUR COUNTER	Unsigned Int 32	
625	IN_Slot6[44]	R	LMV CURRENT ERROR CODE	Unsigned Int 16	see **LMV... Lockout/Error Codes**
626	IN_Slot6[46]	R	LMV CURRENT DIAGNOSTIC CODE	Unsigned Int 16	
627	IN_Slot6[48]	R	LMV CURRENT ERROR CLASS	Unsigned Int 16	

628	IN_Slot6[50]	R	LMV CURRENT ERROR PHASE	Unsigned Int 16	
629	IN_Slot6[52]	R	LMV TEMP LIMIT OFF THRESHOLD	Unsigned Int 16	
630	IN_Slot6[54]	R	LMV SUPPLY AIR TEMPERATURE	Unsigned Int 16	
631	IN_Slot6[56]	R	LMV FLUE GAS TEMPERATURE	Unsigned Int 16	
632	IN_Slot6[58]	R	LMV COMBUSTION EFFICIENCY	Unsigned Int 16	x10
633	IN_Slot6[60]	R	LMV CURRENT CO_2	Unsigned Int 16	x10
634	IN_Slot6[62]	R	LMV CURRENT EXCESS AIR	Unsigned Int 16	x10
635	IN_Slot6[64]	R	LMV INPUT WORD	Unsigned Int 16	word of bits
635 bit 0		R	LMV CONTROLLER SWITCH	Boolean	
635 bit 1		R	LMV FAN CONTACTOR	Boolean	
635 bit 2		R	LMV OIL SELECTED	Boolean	
635 bit 3		R	LMV GAS SELECTED	Boolean	
635 bit 5		R	LMV OIL PRESS SW MAX	Boolean	
635 bit 6		R	LMV OIL PRESS SW MIN	Boolean	
635 bit 7		R	LMV VALVE PROVING SW	Boolean	
635 bit 8		R	LMV SAFETY LOOP	Boolean	
635 bit 10		R	LMV GAS PRESS SW MIN	Boolean	
635 bit 11		R	LMV GAS PRESS SW MAX	Boolean	
635 bit 13		R	LMV AIR PRESSURE SW	Boolean	
635 bit 14		R	LMV START RELEASE OIL	Boolean	
635 bit 15		R	LMV HEAVY OIL START	Boolean	
637	IN_Slot6[66]	R	LMV OUTPUT WORD	Unsigned Int 16	word of bits
637 bit 0		R	LMV ALARM	Boolean	
637 bit 4		R	LMV IGNITION	Boolean	
637 bit 5		R	LMV START SIGNAL	Boolean	
637 bit 6		R	LMV FAN OUTPUT	Boolean	
637 bit 7		R	LMV OIL PUMP	Boolean	
637 bit 8		R	LMV FUEL VALVE SV OIL	Boolean	
637 bit 9		R	LMV FUEL VALVE V1 OIL	Boolean	

637 bit 10		R	LMV FUEL VALVE V2 OIL	Boolean	
637 bit 11		R	LMV FUEL VALVE V3 OIL	Boolean	
637 bit 12		R	LMV FUEL VALVE SV GAS	Boolean	
637 bit 13		R	LMV FUEL VALVE V1 GAS	Boolean	
637 bit 14		R	LMV FUEL VALVE V2 GAS	Boolean	
637 bit 15		R	LMV FUEL VALVE PV GAS	Boolean	
639	IN_Slot6[68]	R	LMV LOAD CONTROL MODE	Unsigned Int 16	see **Note 2** below
641	IN_Slot6[70]	R	LMV MODBUS LOCAL/REMOTE	Unsigned Int 16	
643	IN_Slot6[72]	R	LMV MODBUS OPERATING MODE	Unsigned Int 16	
644	IN_Slot6[74]	R	LMV MODBUS SETPOINT W3	Unsigned Int 16	
645	IN_Slot6[76]	R	LMV MODBUS OUTPUT	Unsigned Int 16	
647	IN_Slot6[78]	R	LMV SETPOINT W1	Unsigned Int 16	
648	IN_Slot6[80]	R	LMV SETPOINT W2	Unsigned Int 16	
658	IN_Slot7[104]	R	LMV TOTAL VOLUME GAS/FUEL0	Unsigned Int 32	
660	IN_Slot7[108]	R	LMV TOTAL VOLUME OIL/FUEL1	Unsigned Int 32	
662	IN_Slot6[82]	R	LMV EXTRA TEMPERATURE SENSOR	Unsigned Int 16	
663	IN_Slot6[84]	R	FEEDWATER E1 U16	Signed Int 16	x10
664	IN_Slot6[86]	R	FEEDWATER E2 U16	Unsigned Int 16	x10
665	IN_Slot6[88]	R	FEEDWATER WR CURRENT SP U16	Signed Int 16	x10
666	IN_Slot6[90]	R	FEEDWATER SP1 U16	Signed Int 16	x10
667	IN_Slot6[92]	R	EA DRAFT SENSOR	Signed Int 16	x100
668	IN_Slot6[94]	R	EA DRAFT FEEDBACK	Unsigned Int 16	x10
686	IN_Slot6[96]	R	EA STATUS WORD	Unsigned Int 16	
686 bit 0		R	EA INPUT 1	Boolean	
686 bit 1		R	EA INPUT 2	Boolean	
686 bit 2		R	EA INPUT 3	Boolean	
686 bit 3		R	EA INPUT 4	Boolean	
686 bit 4		R	EA INPUT 5	Boolean	
686 bit 5		R	EA INPUT 6	Boolean	
686 bit 6		R	EA INPUT 7	Boolean	

686 bit 7		R	EA INPUT 8	Boolean	
686 bit 8		R	EA INPUT 9	Boolean	
686 bit 9		R	EA INPUT 10	Boolean	
686 bit 10		R	EA INPUT 11	Boolean	
686 bit 11		R	EA INPUT 12	Boolean	
686 bit 12		R	EA INPUT 13	Boolean	
687	IN_Slot6[98]	R	EA ALARM WORD	Unsigned Int 16	
687 bit 0		R	EA ALARM INPUT 1	Boolean	
687 bit 1		R	EA ALARM INPUT 2	Boolean	
687 bit 2		R	EA ALARM INPUT 3	Boolean	
687 bit 3		R	EA ALARM INPUT 4	Boolean	
687 bit 4		R	EA ALARM INPUT 5	Boolean	
687 bit 5		R	EA ALARM INPUT 6	Boolean	
687 bit 6		R	EA ALARM INPUT 7	Boolean	
687 bit 7		R	EA ALARM INPUT 8	Boolean	
687 bit 8		R	EA ALARM INPUT 9	Boolean	
687 bit 9		R	EA ALARM INPUT 10	Boolean	
687 bit 10		R	EA ALARM INPUT 11	Boolean	
687 bit 11		R	EA ALARM INPUT 12	Boolean	
687 bit 12		R	EA ALARM INPUT 13	Boolean	
688	IN_Slot6[100]	R	EA RTD 1	Signed Int 16	x10
689	IN_Slot6[102]	R	EA RTD 2	Signed Int 16	x10
690	IN_Slot6[104]	R	EA RTD 3	Signed Int 16	x10
691	IN_Slot6[106]	R	EA RTD 4	Signed Int 16	x10
692	IN_Slot6[108]	R	EA ANALOG INPUT 1 U16	Signed Int 16	x10
693	IN_Slot6[110]	R	EA ANALOG INPUT 2 U16	Signed Int 16	x10
694	IN_Slot6[112]	R	EA ANALOG INPUT 3 U16	Signed Int 16	x10
695	IN_Slot6[114]	R	EA ANALOG INPUT 4 U16	Signed Int 16	x10
696	IN_Slot6[116]	R	EA ECONOMIZER WATER IN	Unsigned Int 16	x10
697	IN_Slot6[118]	R	EA ECONOMIZER WATER OUT	Unsigned Int 16	x10
698	IN_Slot6[120]	R	EA ECONOMIZER STACK IN	Unsigned Int 16	x10
699	IN_Slot6[122]	R	EA ECONOMIZER STACK OUT	Unsigned Int 16	x10

Gateway – Mapping (continued)

Note 1 – This value is a percent x10. If the value exceeds 1000, it indicates stages.

- **1001:** 1 stage
- **1002:** 2 stages
- **1003:** 3 stages

Note 2 – LMV5 sensor selection.

- **0:** Pt100
- **1:** Pt1000
- **2:** Ni1000
- **3:** temperature sensor
- **4:** pressure sensor
- **5:** Pt100/Pt1000
- **6:** Pt100/Ni1000
- **7:** no sensor

Note 3 – LMV program stop.

- **0:** deactivated (LMV5, LMV3)
- **1:** prepurge phase 24 (LMV5, LMV3)
- **2:** prepurge FGR phase 32 (LMV5), ignition position phase 36 (LMV3)
- **3:** ignition position phase 36 (LMV5), interval 1 phase 44 (LMV3)
- **4:** interval 1 phase 44 (LMV5), interval 2 phase 52 (LMV3)
- **5:** interval 2 phase 52 (LMV5)
- **6:** postpurge phase 72 (LMV5)
- **7:** postpurge FGR phase 76 (LMV5)

Note 4 – LMV5 operating mode.

- **0:** external load control X5-03
- **1:** internal load control
- **2:** internal load control bus
- **3:** internal load control X62
- **4:** external load control X62
- **5:** external load control bus

Note 5 – LMV5 adaption state.

- **0:** undefined
- **1:** identification completed, parameter determined
- **2:** undefined
- **3:** adaption aborted by user
- **4:** temperature difference too small, temperature will be lowered with low fire
- **5:** monitoring time running

- **6:** delivery of identification load set
- **7:** error during identification (path)
- **8:** error during identification (internal)
- **9:** monitoring time running
- **10:** changeover from modulating to multistage during an identification
- **11:** timeout monitoring time
- **12:** timeout heating output on path with monitoring

Note 8 – LMV3 fuel train.

Mode	Fuel Train	Fuel-Air Ratio Control	Ignition	Fuel Act.	Air Act.	Monitored VSD
1	G mod	modulating electronic	direct spark	x	x	x
2	Gp1 mod	modulating electronic	pilot between V1/V2	x	x	x
3	Gp2 mod	modulating electronic	pilot before V1/V2	x	x	x
4	Lo mod	modulating electronic	direct spark	x	x	x
5	Lo 2-stage	2-stage electronic	direct spark		x	x
6	Lo 3-stage	3-stage electronic	direct spark		x	x
7	G mod pneu	modulating pneumatic	direct spark		x	
8	Gp1 mod pneu	modulating pneumatic	pilot between V1/V2		x	
9	Gp2 mod pneu	modulating pneumatic	pilot before V1/V2		x	
10	LoGp mod	modulating electronic	gas pilot	x	x	x
11	LoGp 2-stage	2-stage electronic	gas pilot		x	x
12	Lo mod (2 valves)	modulating electronic	direct spark	x	x	x
13	LoGp mod (2 valves)	modulating electronic	gas pilot	x	x	x
14	G mod pneu	modulating pneumatic	direct spark			
15	Gp1 mod pneu	modulating pneumatic	pilot between V1/V2			
16	Gp2 mod pneu	modulating pneumatic	pilot before V1/V2			
17	Lo 2-stage	2-stage electronic	direct spark			x
18	Lo 3-stage	3-stage electronic	direct spark			x
19	G mod pneu	modulating pneumatic	direct spark	x		x
20	Gp1 mod pneu	modulating pneumatic	pilot between V1/V2	x		x
21	Gp2 mod pneu	modulating pneumatic	pilot before V1/V2	x		x
22	Lo mod	modulating electronic	direct spark	x		x
23	Ho mod circ	mod. electronic, pump control	direct spark	x	x	x
24	Ho 2-stage circ	2-st. electronic, pump control	direct spark		x	x
25	Ho mod	modulating electronic	direct spark	x	x	x
26	Ho 2-stage	2-stage electronic	direct spark		x	x
27	Ho 3-stage	3-stage electronic	direct spark		x	x
28	G mod mech	modulating mechanical	direct spark		x	x
29	Gp2 mod mech	modulating mechanical	pilot before V1/V2		x	x
255	not defined	---	---			

LMV PHASES

NUMBER	DESCRIPTION
0	LOCKOUT PHASE
1	SAFETY PHASE
2	SAFETY PHASE
10	HOME RUN POSITION
12	STANDBY STATIONARY
20	SAFETY RELAY ON
21	RELEASE OF STARTUP
22	FAN MOTOR ON
24	DRIVE TO PURGE
30	PREPURGE
32	PREPURGE FGR
34	PREPURGE
35	VSD DRIVE TO IGNITION
36	DRIVE TO IGNITION
38	PREIGNITION SPARK ON
39	GAS VALVE TEST MINIMUM PRESSURE
40	PILOT VALVE OPEN
42	SPARK OFF
44	FLAME STABILIZATION
50	FUEL VALVE OPEN SAFETY TIME
52	FLAME STABILIZATION
54	DRIVE TO LOW FIRE
60	NORMAL OPERATION
62	DRIVE TO LOW FIRE POST
64	DRIVE TO IGNITION
65	FLAME STABILIZATION
66	IGNITION/PILOT ON
67	MAIN VALVE OFF
68	PILOT WAITING TIME
69	PILOT WAITING - STARTUP
70	FUEL VALVE CLOSED AFTER BURN TIME
72	DRIVE TO POSTPURGE
74	MANDATORY POSTPURGE
76	MANDATORY POSTPURGE
78	OPTIONAL POSTPURGE
79	DIRECT START (APS CHECK)
80	GV TEST EVACUATION OF TEST SPACE
81	GV TEST ATMOSPHERIC PRESSURE TEST
82	GV TEST FILL TEST SPACE
83	GV TEST PRESSURE TEST
90	GAS SHORTAGE WAITING TIME
97	NO CONFIGURATION
98	WAITING TO ESTABLISH COMMUNICATION
99	COMMUNICATION FAULT

LMV5 Lockout/Error Codes

LMV5 Lockout/Error Codes

CODE DECIMAL	CODE HEX	DESCRIPTION
0	0	NO ERROR
1	1	ROM ERROR
2	2	RAM ERROR
3	3	INTERNAL COMMUNICATION ERROR
4	4	UNSUCCESSFUL SYNC OF 2uCs
5	5	FAULT DURING FLAME AMP TEST
6	6	FAULT INTERNAL HARDWARE TEST
16	10	DIGITAL OUTPUT FAULT
17	11	SHORT CIRCUIT CONTACT FEEDBACK
21	15	ACTUATOR FAULT/VSD SPEED NOT REACHED
22	16	FAULT IN RATIO CONTROL SYSTEM
23	17	LMV5 INTERNAL COM ERROR
24	18	CORRUPTION IN COMBUSTION CURVE DATA
25	19	ACTUATOR POT ERROR
26	1A	ACTUATOR CURVE TOO STEEP
27	1B	ACT CURVE PROGRAMMING ACTIVE PHASE 62
28	1C	ACTUATOR IGNITION POSITION NOT SET
29	1D	RUNNING TIME FAULT ACTUATORS/VSD
30	1E	ACTUATOR/VSD NOT REACHED POSITION
31	1F	VSD MODULE CONNECTION ERROR
33	21	SAFETY LOOP OPEN
34	22	TEMP LIMITER OFF (CHECK SENSOR)
35	23	EXTRANEOUS LIGHT DURING STARTUP
36	24	EXTRANEOUS LIGHT DURING SHUTDOWN
37	25	NO FLAME AT END OF SAFETY TIME
38	26	LOSS OF FLAME PHASE 60-62
39	27	AIR PROVE SW ON SHOULD BE OFF
40	28	AIR PROVE SW OFF SHOULD BE ON
41	29	FAN CONTACT SIGNAL ON SHOULD BE OFF
42	2A	FAN CONTACT SIGNAL OFF SHOULD BE ON
43	2B	FGR PRESSURE SW ON SHOULD BE OFF
44	2C	FGR PRESSURE SW OFF SHOULD BE ON
45	2D	CPI (POC) ON SHOULD BE OFF
46	2E	CPI (POC) OFF SHOULD BE ON
47	2F	LOW GAS PRESSURE SWITCH OPEN
48	30	HIGH GAS PRESSURE SWITCH OPEN
49	31	VALVE PROVE – GAS SIDE LEAK
50	32	VALVE PROVE – BURNER SIDE LEAK
51	33	OIL PRESSURE WHEN OIL PUMP OFF
52	34	LOW OIL PRESSURE WHEN PUMP RUNNING
53	35	HIGH OIL PRESSURE SWITCH OPEN
54	36	NO START RELEASE FOR OIL
55	37	NO HEAVY OIL DIRECT START
56	38	SHORTAGE OF GAS PROGRAM IN PROGRESS
57	39	PARAMETER OF MAX SAFETY TIME FAULTY
58	3A	NO BURNER ID DEFINED

59	3B	NO SERVICE PASSWORD DEFINED
64	40	WRONG CONTACT POSITION OF SAFETY TIME
65	41	WRONG CONTACT POSITION OF IGNITION
66	42	WRONG CONTACT POSITION OF FUEL RELAY
67	43	PLAUSIBILITY CHECK FAULT
68	44	FAULT AT DEACTIVATED INPUTS
69	45	SHUTDOWN VIA SAFETY LIMIT TEST
70	46	PROGRAM STOP ACTIVATED
71	47	START RELEASE GAS IS OFF
72	48	TWO FLAME SIGNALS WITH ONE PARMETERIZED
80	50	FAULT DURING KEY VALUE CHECK
81	51	TIME BLOCK OVERFLOW
82	52	STACK ERROR
83	53	FAULTY RESET STATE OCCURRED
87	57	INVALID PARAMETERIZATION
88	58	INTERNAL COMMUNICATION (uC1<>uC2)
89	59	EEPROM PAGE IS ON ABORT
90	5A	CRC ERROR OF PARAMETER RANGE
91	5B	PAGE ON ABORT
92	5C	PAGE ON WR_RESTO (BACKUP RESTORE MADE)
93	5D	PAGE OPEN TOO LONG
94	5E	PAGE HAS UNDEFINED STATUS
95	5F	LAST BACKUP RESTORE INVALID (INTERRUPTED)
96	60	FAULT COPYING A PARAMETER PAGE
97	61	FAULT WITH EEPROM INITIALIZATION
112	70	FAULT DURING RESTORING LOCKOUT INFO
113	71	MANUAL LOCKOUT VIA CONTACT
114	72	PLAUSIBILITY FAULT WITH FAULT ENTRY
128	80	WRONG STATE OF AUX3 ACTUATOR
129	81	WRONG STATE OF AIR ACTUATOR
130	82	WRONG STATE OF GAS ACTUATOR
131	83	WRONG STATE OF OIL ACTUATOR
132	84	WRONG STATE OF AUX1 ACTUATOR
133	85	WRONG STATE OF AUX2 ACTUATOR
134	86	WRONG STATE OF INTERNAL LOAD CONTROLLER
135	87	WRONG STATE OF AZL
136	88	PLAUSIBILITY FAULT (NMT)
144	90	ROM-CRC ERROR ON AUX3 FEEDBACK
145	91	ROM-CRC ERROR ON AIR FEEDBACK
146	92	ROM-CRC ERROR ON GAS FEEDBACK
147	93	ROM-CRC ERROR ON OIL FEEDBACK
148	94	ROM-CRC ERROR ON AUX1 FEEDBACK
149	95	ROM-CRC ERROR ON AUX2 FEEDBACK
150	96	ROM-CRC ERROR ON LC FEEDBACK
151	97	ROM-CRC ERROR ON AZL FEEDBACK
152	98	CANBUS DEVICE WITH SAME ADDRESS CONFLICT
153	99	CANBUS IS OFF
154	9A	CANBUS WARNING LEVEL

155	9B	CANBUS QUEUE OVERRUN
160	A0	AUX3 ACTUATOR DETECTED A FAULT
161	A1	AIR ACTUATOR DETECTED A FAULT
162	A2	GAS ACTUATOR DETECTED A FAULT
163	A3	OIL ACTUATOR DETECTED A FAULT
164	A4	AUX1 ACTUATOR DETECTED A FAULT
165	A5	AUX2 ACTUATOR DETECTED A FAULT
166	A6	LOAD CONTROL DETECTED A FAULT
167	A7	AZL DETECTED A FAULT
169	A9	VSD MODULE DETECTED A FAULT
171	AB	O_2 MODULE DETECTED A FAULT
176	B0	FAULT DURING TEST OF PORT OUTPUTS
177	B1	FAULT DURING SHORT CIRCUIT TEST
181	B5	O_2 MONITOR FAULT
186	BA	O_2 SENSOR TEST FAILED
187	BB	O_2 TRIM CONTROL REMOVED
190	BE	INVALID PARAMETERIZATION O_2 CONTROL
191	BF	O_2 CONTROL AUTO DEACTIVATION
197	C5	AZL HAS DETECTED OLD UNIT VERSIONS
209	D1	WRONG STATE OF VSD MODULE
211	D3	WRONG STATE OF O_2 MODULE
225	E1	ROM-CRC ERROR ON VSD MODULE FEEDBACK
227	E3	ROM-CRC ERROR ON O_2 MODULE FEEDBACK
240	F0	PLAUSIBILITY FAULT (INTERPOLATION)
241	F1	FAULT CALCULATING PRECONTROL
242	F2	FAULTY TEMP VALUES FROM O_2 MODULE
243	F3	O_2 TRIM CONTROL FAULT
244	F4	O_2 MODULE FAULT (FGR)
245	F5	CANBUS FEEDBACK FAULT X60 TEMP INPUT
246	F6	FGR FAULT

LMV3 Error Codes

LMV3 Error Codes

CODE	DESCRIPTION
2	NO FLAME AT END OF SAFETY TIME
3	AIR PRESSURE FAILURE
4	EXTRANEOUS LIGHT
7	LOSS OF FLAME
12	VALVE PROVING
14	PROOF OF CLOSURE
18	AIR PRESSURE SWITCH SPEED DEPENDENT
19	COMBUSTION PRESSURE POC
20	PRESSURE SWITCH – MINIMUM
21	PRESSURE SWITCH – MAXIMUM
22	SAFETY LOOP / BURNER FLANGE
23	LOW GAS / HEAVY OIL DIRECT START
50	INTERNAL ERROR
51	INTERNAL ERROR
55	INTERNAL ERROR
56	INTERNAL ERROR
57	INTERNAL ERROR
58	INTERNAL ERROR
60	INTERNAL ERROR – NO VALID HEAT SOURCE
61	FUEL CHANGEOVER
62	INVALID FUEL SIGNALS OR INFORMATION
65	INTERNAL ERROR
66	INTERNAL ERROR
67	INTERNAL ERROR
70	INTERNAL ERROR – FUEL/AIR RATIO CONTROL
71	SPECIAL POSITION UNDEFINED
72	INTERNAL ERROR – FUEL/AIR RATIO CONTROL
73	INTERNAL ERROR – FUEL/AIR RATIO CONTROL
75	INTERNAL ERROR – FUEL/AIR RATIO CONTROL
76	INTERNAL ERROR – FUEL/AIR RATIO CONTROL
80	CONTROL RANGE LIMIT OF VSD
81	VSD ELECTROMAGNETIC INTERFERENCE
82	ERROR DURING VSD SPEED STANDARDIZATION
83	SPEED ERROR VSD
84	CURVE SLOPE ACTUATORS
85	ACTUATOR REFERENCING ERROR
86	ERROR FUEL ACTUATOR
87	ERROR AIR ACTUATOR
90	INTERNAL ERROR – BASIC UNIT
91	INTERNAL ERROR – BASIC UNIT
93	ERROR FLAME SIGNAL ACQUISITION
95	ERROR RELAY SUPERVISION
96	ERROR RELAY SUPERVISION
97	ERROR RELAY SUPERVISION

98	ERROR RELAY SUPERVISION
99	INTERNAL ERROR – RELAY CONTROL
100	INTERNAL ERROR – RELAY CONTROL
105	INTERNAL ERROR – CONTACT SAMPLING
106	INTERNAL ERROR – CONTACT REQUEST
107	INTERNAL ERROR – CONTACT REQUEST
108	INTERNAL ERROR – CONTACT REQUEST
110	INTERNAL ERROR – VOLTAGE MONITOR TEST
111	POWER FAILURE
112	MAINS VOLTAGE RECOVERY
113	INTERNAL ERROR – MAINS VOLTAGE
115	INTERNAL ERROR – SYSTEM COUNTER
116	DESIGN THRESHOLD EXCEEDED
117	LIFETIME EXCEEDED – OPERATION NOT ALLOWED
120	FUEL METERING INTERFERENCE
121	INTERNAL ERROR – EEPROM ACCESS
122	INTERNAL ERROR – EEPROM ACCESS
123	INTERNAL ERROR – EEPROM ACCESS
124	INTERNAL ERROR – EEPROM ACCESS
125	INTERNAL ERROR – EEPROM READ ACCESS
126	INTERNAL ERROR – EEPROM WRITE ACCESS
127	INTERNAL ERROR – EEPROM ACCESS
128	INTERNAL ERROR – EEPROM ACCESS
129	INTERNAL ERROR – EEPROM ACCESS
130	INTERNAL ERROR – EEPROM ACCESS
131	INTERNAL ERROR – EEPROM ACCESS
132	INTERNAL ERROR – EEPROM REG INITIALIZATION
133	INTERNAL ERROR – EEPROM REQUEST SYNC
134	INTERNAL ERROR – EEPROM REQUEST SYNC
135	INTERNAL ERROR – EEPROM REQUEST SYNC
136	RESTORE STARTED
137	INTERNAL ERROR – BACKUP/RESTORE
146	TIMEOUT – BAS MODBUS
150	TUV TEST
154	TRIM FUNCTION – INVALID ANALOG
155	TRIM FUNCTION – INVALID CURVE
156	TRIM FUNCTION – TIMEOUT
157	TRIM FUNCTION – TEST FAIL
165	INTERNAL ERROR
166	INTERNAL ERROR – WATCHDOG TEST
167	MANUAL LOCKING
168	INTERNAL ERROR – MANAGEMENT
169	INTERNAL ERROR – MANAGEMENT
170	INTERNAL ERROR – MANAGEMENT
171	INTERNAL ERROR – MANAGEMENT
200	NO ERROR
201	PREVENTION OF STARTUP
202	INTERNAL ERROR – OPERATING MODE SELECT
203	INTERNAL ERROR
204	PROGRAM STOP

205	INTERNAL ERROR
206	COMBINATION OF UNITS NOT ALLOWED
207	AZL VERSION COMPATIBILITY ERROR
208	INTERNAL ERROR
209	INTERNAL ERROR
210	SELECTED MODE NOT RELEASED FOR BASIC UNIT
240	INTERNAL ERROR
242	INVALID PARAMETERIZATION
245	INTERNAL ERROR
250	INTERNAL ERROR

460PSMM-N34
Protocol Gateway
Product User Guide

Firmware Version 5.2.14

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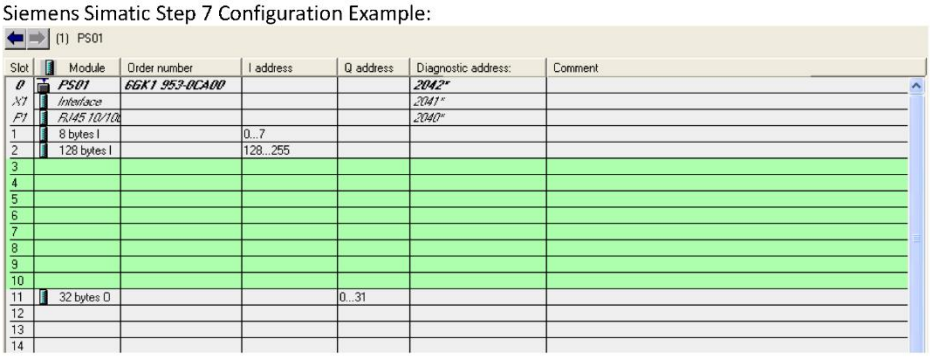
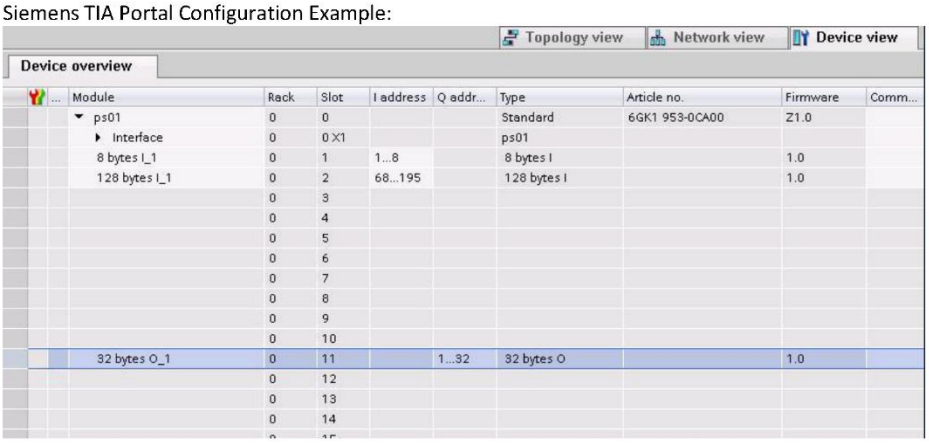
Example Setup

Siemens Simatic Step 7 Configuration Example:


(1) PS01

Slot	Module	Order number	I address	Q address	Diagnostic address:	Comment
0	PS01	6GK1 953-0CA00			2042*	
X1	Interface				2041*	
P1	RJ45 10/10				2040*	
1	8 bytes I		0...7			
2	128 bytes I		128...255			
3						
4						
5						
6						
7						
8						
9						
10						
11	32 bytes O			0...31		
12						
13						
14						

Siemens TIA Portal Configuration Example:


Topology view | Network view | Device view

Device overview

Module	Rack	Slot	I address	Q addr...	Type	Article no.	Firmware	Comm...
ps01	0	0			Standard	6GK1 953-0CA00	Z1.0	
Interface	0	0 X1			ps01			
8 bytes I_1	0	1	1...8		8 bytes I		1.0	
128 bytes I_1	0	2	68...195		128 bytes I		1.0	
	0	3						
	0	4						
	0	5						
	0	6						
	0	7						
	0	8						
	0	9						
	0	10						
32 bytes O_1	0	11		1...32	32 bytes O		1.0	
	0	12						
	0	13						
	0	14						

Gateway Configuration Example:

Input Slots

Slot	Data Size (Bytes)	Data Format
1	8	16 Bit Uint
2	128	64 Bit Float
3	Disabled	16 Bit Int
4	Disabled	16 Bit Int
5	Disabled	16 Bit Int

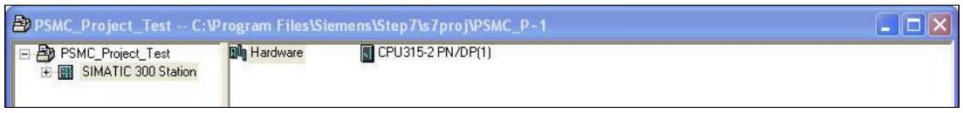
Output Slots

Slot	Data Size (Bytes)	Data Format
11	32	32 Bit Int
12	Disabled	16 Bit Int
13	Disabled	16 Bit Int
14	Disabled	16 Bit Int
15	Disabled	16 Bit Int

Setting up the PLC- Example Using Simatic Step 7 software

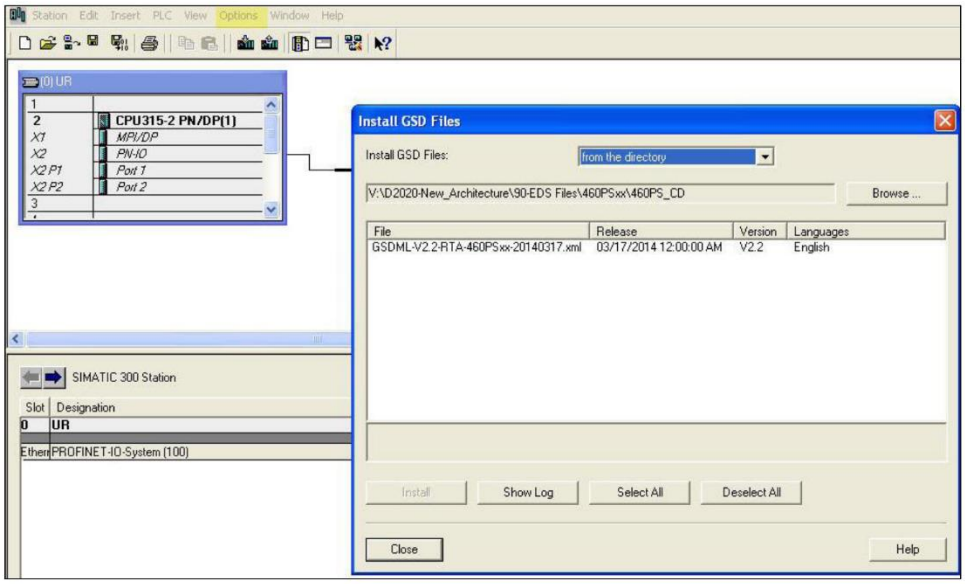
This is how you would set up the Example Setup on the previous page using Simatic Step 7:

1) In your project, click the CPU and you should see the Hardware option in the right pane. Double click on the Hardware icon.



2) IF YOU HAVE ALREADY INSTALLED THE GSD FILE, SKIP TO STEP 9.

   OTHERWISE - Under Options, select **Install GSD Files**.



3) Insert the CD that was shipped with the gateway and select Install GSD Files from the directory.

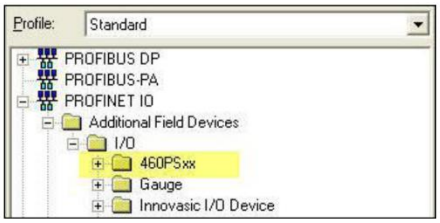
4) Browse to the CD and find the folder containing the GSD file.

5) Select the GSD file from the box and click **Install**.

6) When prompted to confirm installation because it cannot be undone, click **Yes**.

7) Click **OK** acknowledging that the install was successful.

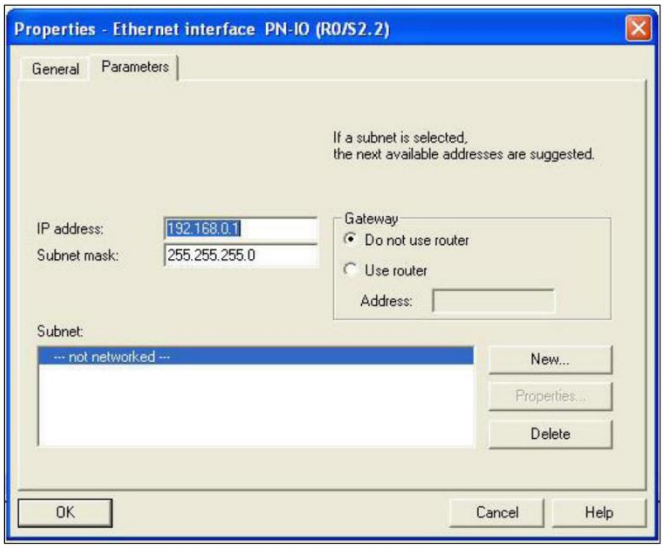
8) If you navigate to the right-hand side, you will see the RTA profile under: PROFINET IO->Additional Field Devices->I/O->460PSxx



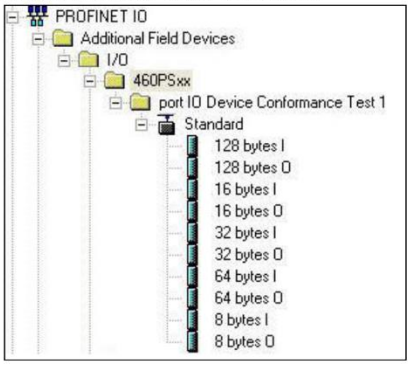
9) IF YOU HAVE ALREADY CONFIGURED THE PROFINET I/O CONTROLLER, SKIP TO STEP 11.

   OTHERWISE - Right-click on the PN-IO block and select **Insert PROFINET IO System**.

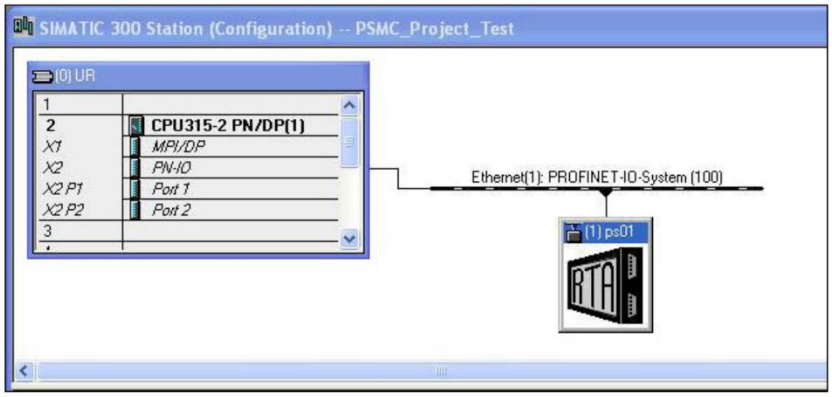
10) In the properties window, set the IP Address to match that of the PROFINET I/O Controller and press **New** and **OK**.



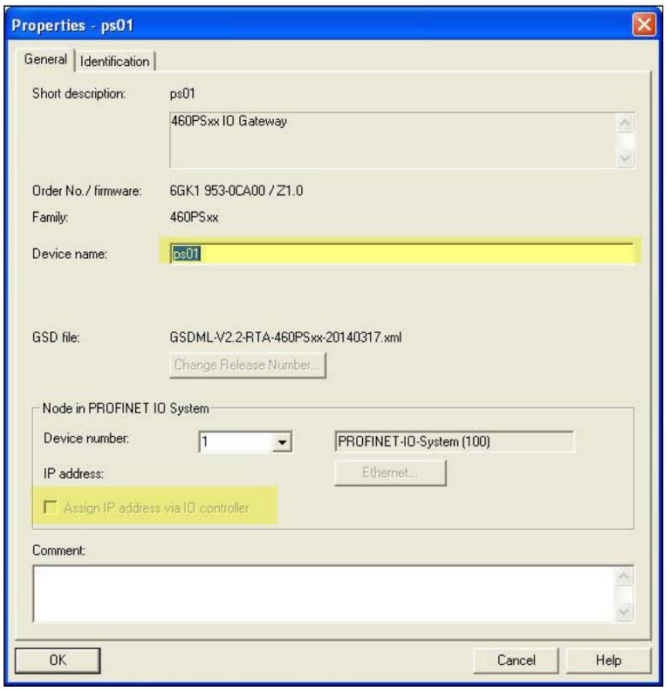
11) Find the RTA device in the I/O tree. It will be under PROFINET IO->Additional Field Devices->I/O ->460PSxx->port IO Device Conformance Test 1->Standard.



12) Once found, drag the Standard icon into the network line you created in Step 9.



13) Double-click the gateway icon to open the properties window. Make sure the **Device Name** field matches exactly (case-sensitive) to the **Device Label** field in the PROFINET IO Server Configuration page. If not already done, uncheck the **Assign IP Address via IO controller option** (some versions already do this) and press **OK**.



14) Expand the Standard node on the right panel to show the available modules to insert (Refer to the picture in Step 11).

Input Slots			Output Slots		
Slot	Data Size (Bytes)	Data Format	Slot	Data Size (Bytes)	Data Format
1	8	16 Bit Uint	11	32	32 Bit Int
2	128	64 Bit Float	12	Disabled	16 Bit Int
3	Disabled	16 Bit Int	13	Disabled	16 Bit Int
4	Disabled	16 Bit Int	14	Disabled	16 Bit Int
5	Disabled	16 Bit Int	15	Disabled	16 Bit Int

To match the above configuration in the 460 gateway, add one 8-byte input module to slot 1, one 128-byte input module to slot 2, and one 32-byte output module to slot 11.

Siemens PLC Configuration:

(1) PS01

Slot	Module	Order number	I address	Q address	Diagnostic address:	Comment
0	PS01	6GK1 953-0CA00			2042*	
X1	Interface				2041*	
P1	RJ45 10/100				2040*	
1	8 bytes I		0...7			
2	128 bytes I		128...255			
3						
4						
5						
6						
7						
8						
9						
10						
11	32 bytes O			0...31		
12						
13						
14						

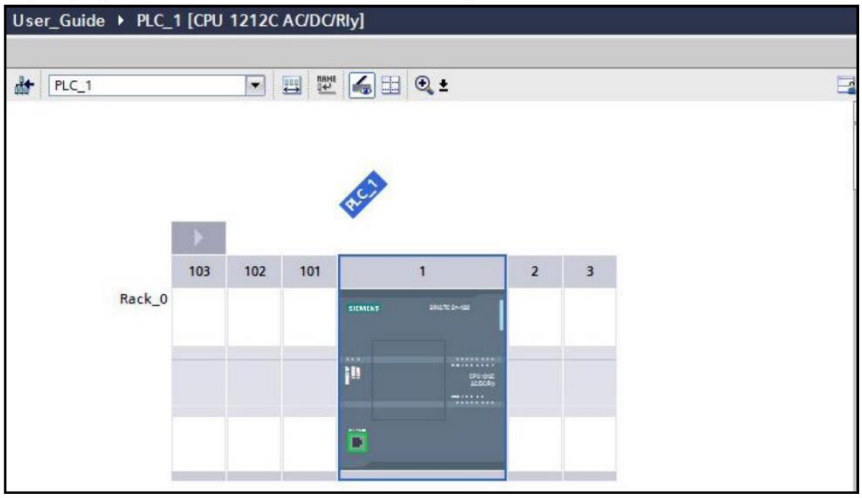
Terminology Note and Example: *I addresses refer to Input, Q addresses refer to Output, %B refers to bytes and %W refers to words. So in this case, you would use %IB0-7, %IB128-255 and %QB0-31 to access the data to/from the gateway in the PLC.*

15) When finished, click the **Save and Compile** button and then the **Download to PLC** button.

Setting up the PLC- Example Using TIA Portal

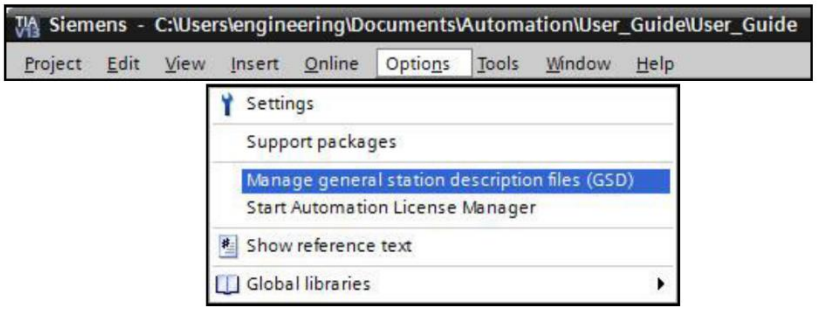
This is how you would set up the Example Setup using Siemens TIA Portal:

1) In your project, click the Device View tab and click your PLC.



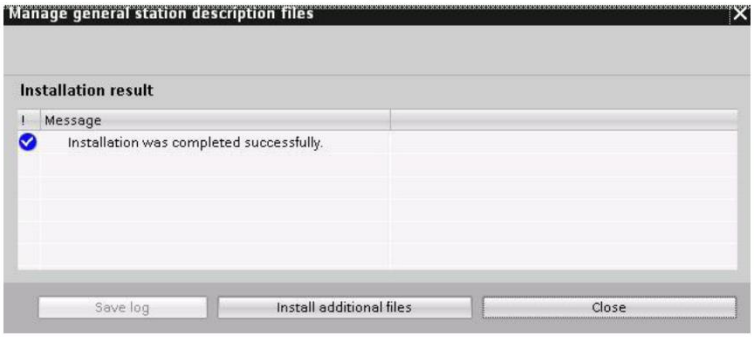
2) IF YOU HAVE ALREADY INSTALLED THE GSD FILE, SKIP TO STEP 9.

   OTHERWISE - Under Options, select **Manage general station description file (GSD).**

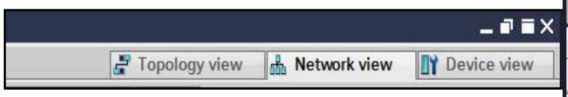


3) Insert the CD that was shipped with the gateway and save off the GSD file on that CD to your desktop.
4) Click **…** and browse to where you saved the GSD file.
5) Check the box to the left of the imported path and click **Install**.

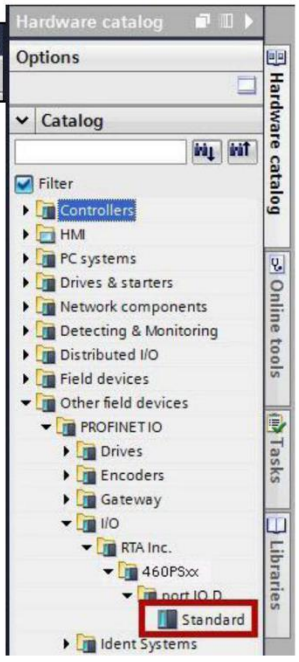
6) Click **Close** when it was installed successfully.



7) Click the Network View tab in your project.



8) Navigate to the right-hand side of the screen under the Hardware catalog and you will see the RTA profile under: Other field devices->PROFINET IO-> I/O->RTA Inc. -> 460PSxx->port IO Device Conformance Test 1 ->Standard



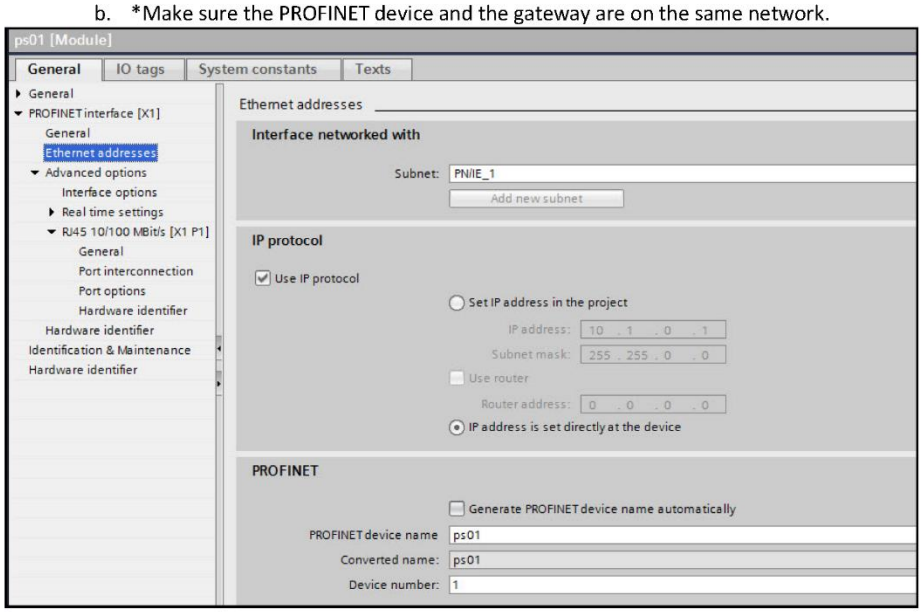
9) Drag the Port IO standard into the Network next to the PLC.

10) Once the RTA device is in the network click the Device view tab.

11) From the dropdown menu select ps01. Right click on the RTA device to select Properties.

12) Go down to the Ethernet addresses.

13) Be sure that the "IP address is set directly at the device" option is selected and uncheck the "Generate PROFINET device name automatically."
    a. *Make sure the **PROFINET Device Name** field matches exactly (case-sensitive) to the **Device Label** field in the PROFINET IO Server Configuration page.
    b. *Make sure the PROFINET device and the gateway are on the same network.

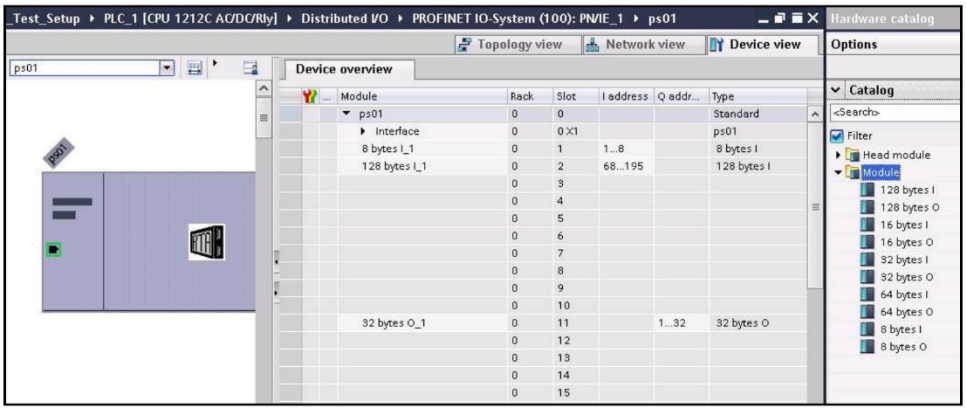


14) Expand the Module list under the catalog on the right panel to show the available modules to insert into the device overview slots.

Input Slots			Output Slots		
Slot	Data Size (Bytes)	Data Format	Slot	Data Size (Bytes)	Data Format
1	8	16 Bit Uint	11	32	32 Bit Int
2	128	64 Bit Float	12	Disabled	16 Bit Int
3	Disabled	16 Bit Int	13	Disabled	16 Bit Int
4	Disabled	16 Bit Int	14	Disabled	16 Bit Int
5	Disabled	16 Bit Int	15	Disabled	16 Bit Int

To match the above configuration in the 460 gateway, add one 8-byte input module to slot 1, one 128-byte input module to slot 2, and one 32-byte output module to slot 11.

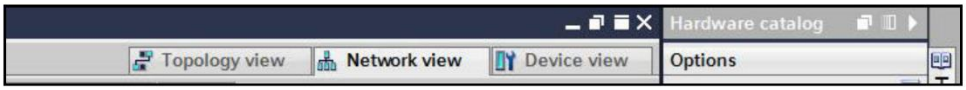
TIA Portal Configuration:

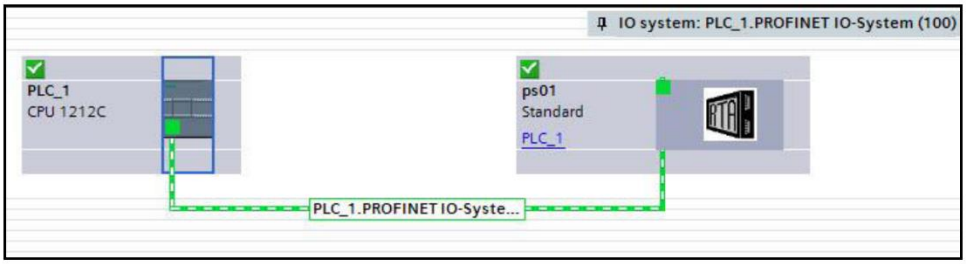


To insert a module, just double click to add it to the next available slot.

Terminology Note and Example: *I addresses refer to Input, Q addresses refer to Output, %B refers to bytes and %W refers to words. So in this case, you would use %IB1-8, %IB68-195 and %QB1-32 to access the data to/from the gateway in the PLC.*

15) In the Network view tab, click the port of the RTA ps01 and drag the line into the port of the PLC. Once the link has been established click the Compile button and Download to Device button (in red).





16) Once everything is downloaded to the PLC there will be a green check box on both devices, then click **Go Online** (see red box).