



**Modbus Interfacing  
Version 1.3  
Release 0 of the 07 April 2017**

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## Contents

<b>1</b>	<b>Modbus Connection.....</b>	<b>3</b>
1.1	Modbus configuration .....	3
1.2	Modbus Functionality .....	3
1.2.1	<i>System overview (example)</i> .....	4
1.3	Modbus holding registers.....	4
1.3.1	<i>Control register</i> .....	4
1.3.2	<i>Controller Type</i> .....	5
1.3.3	<i>Modbus Version</i> .....	5
1.3.4	<i>Modbus Units</i> .....	6
1.4	Pre-defined devices .....	6

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## 1 Modbus Connection

### 1.1 Modbus configuration

The table below summarizes the Modbus configuration details;

Modbus configuration	
Protocol	Modbus RTU
Default slave address	0x01 (settable with LabVision or by dll)
Supported Modbus commands	Read Holding registers (0x03) Write single holding register (0x06)
Baud rate	9600bps
Data Length	8
Parity	None
Stop Bits	2
Physical layer	RS485 (two wire + optional GND)

The default setting for the Modbus address is 0. The address setting resides in the e2prom of the 885IF interface and can be changed if required. This can be done LabVision, via the Argus link connection.

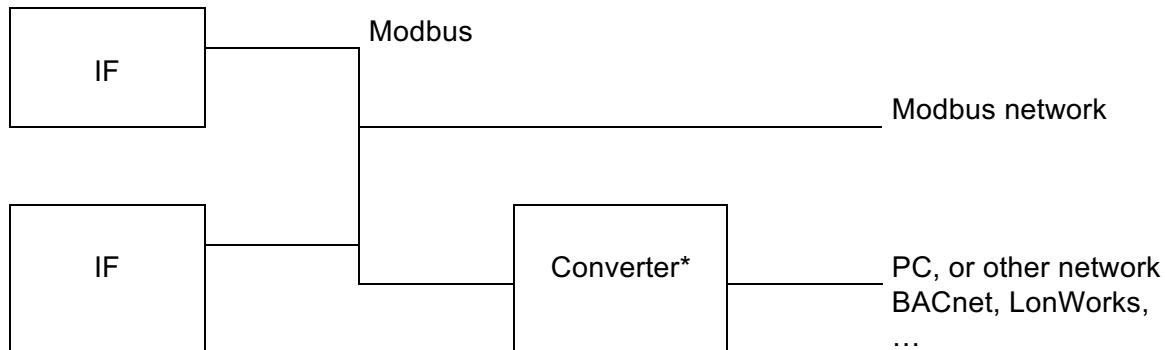
Multiple holding registers can be read (up to all of the available registers for the device), writing of holding registers is limited to one register at a time.

### 1.2 Modbus Functionality

The basic modbus functionality gives control over the devices connected by their modbus interface. The control includes building management systems, remote displays, PLC control.

On installation all Argus devices must be set at a unique modbus address. To connect to networks other than modbus, bus converters can be connected to the system. The optional bus converter can then scans these addresses for active devices, and map them on the network it needs to convert to.

### 1.2.1 System overview (example)



## 1.3 Modbus holding registers

Modbus communicates using words (the contents of 16bit holding registers). The data that is offered is organized as a list of bytes.

Depending on the type of Modbus software used, the holding register addressing range starts either at 0x0000 or at 0x0001. If your Modbus software starts addressing from 0x0000 you can use the holding register addresses shown in the table above. If your Modbus software addressing range starts at 0x0001 then add 1 to the holding register addresses listed in the table above. This is also true for the various test tools available for Modbus.

### 1.3.1 Control register

A special control register is implemented to secure certain modbus actions / commands. To activate these actions / commands, first the control register must be written.



This must be done only when initiating a write command to a holding register. Do not send this command when no write enable is needed to prevent holding registers from being corrupted.

Holding register		Access		Parameter name	Automatic Conversion	Range
		R	W			
99	0063	X	X	Control register		Bit0: Write enable .. Bit14: Controller Reset

When no Modbus communication (reading or writing) is sensed for more than 4,0 Seconds the *control register* bits will be reset. The bits will also be reset when undefined bits (i.e. other than bits 0 and 14) are set.

### 1.3.1.1 Write enable

The 'Write enable' register controls the reading and writing of the holding registers.

'Write enable' = 0: the data in the holding register is read only.

'Write enable' = 1: the data in the holding register can be written.



Writing of parameters with a different value is limited to 10.000 times.  
 All (CH,DHW) set points and parameters are for preset only, they can be changed with an average of 2 changes per day.  
 Not to be used for dynamic temperature control!

### 1.3.1.2 Controller reset

A controller may be reset (only) when it is in error. Only Lock out errors can be reset. When the controller is in error, it can be reset by setting bit 14 to the control holding register (0x0063) of the Modbus interface. The Interface board then sends a reset command to the controller over the Argus Link bus. Once it has done this, it resets the reset bit of the Control holding register.

### 1.3.2 Controller Type

For easier handling of holding registers, the data format can be changed on the modbus interface. This means that all unit conversion is done in the modbus interface (for both reading and writing data).

Holding register	Access		Parameter name	Automatic Conversion	Range
	R	W			
97	0061	X	Main Control Group Number	V	0000 – 10000

The group number will identify the Main Control Group number which identifies specific system settings.

### 1.3.3 Modbus Version

For easier handling of holding registers, the data format can be changed on the modbus interface. This means that all unit conversion is done in the modbus interface (for both reading and writing data).

Holding register	Access		Parameter name	Automatic Conversion	Range
	R	W			
98	0062	X	Modbus Version		13

On readout the value can be displayed with the unit set in this holding register without conversion other than decimal point correction. So 13 is 1.3.

### 1.3.4 Modbus Units

For easier handling of holding registers, the data format can be changed on the modbus interface. This means that all unit conversion is done in the modbus interface (for both reading and writing data).

Holding register		Access		Parameter name	Automatic Conversion	Range
		R	W			
100	0064	X	X	Modbus Units		Bit0: °C Bit1: °F

To change the units, first enable writing in the control register, and then set the appropriate configuration bits in the *Modbus Units* register.

To enable decimals on readout, values are multiplied before they are stored in the holding register. They must be divided on readout to obtain the original value.

- Temperatures: resolution xxx.xx factor 100 Unit as set in Unit register
- Voltages: resolution xx.x factor 10 Unit as set in Unit register

On readout the value can be displayed with the unit set in this holding register without conversion other than decimal point correction.

## 1.4 Pre-defined devices

For all devices, empty or not available holding registers return 0.

When it is not implemented requests can be ignored by the Modbus device.

Holding registers must be readed from 97. Starting reading from lower values will result in bad answer from the IF board.

Holding register		Access		Parameter name (Nome parametro)	Description (Descrizione)	Automatic Conversion (Conversione automatica)	Range	Campo di regolazione
100	0064	R	W	Modbus Units	Unit of measure of the temperature (Unità di misura della temperatura)		Bit0: °C Bit1: °F	Bit0: °C Bit1: °F
101	0065	R		NA	NA		NA	NA
102	0066	R		State	State of the burner on <u>appliances with one burner only</u> (Condizione del bruciatore in apparecchi monobruciatore)		2 = Stand by 9 = In burn 13 = Fan in post purge 15 = Post pumping	2 = In attesa 9 = In funzione 13 = Ventilatore in post ventilazione 15 = Pompa in post circolazione
103	0067	R		Status	Status of the burner on <u>appliances with one burner only</u> (Condizione del bruciatore in apparecchi monobruciatore)		0 = Stand by 16 = Heat demand	0 = In attesa 16 = Richiesta di calore
104	0068	R		Error Code	Error code on <u>appliances with one burner only</u> (Codice di errore per apparecchi monobruciatore)		See error list into the IOM	Vedere elenco errori nel manuale
105	0069	R		N/A	N/A		N/A	N/A
106	006A	R	W	Boiler CH SP	Heating setpoint (Temperatura di setpoint del riscaldamento)	V	°C / °F	°C / °F
107	006B	R	W	Boiler DHW SP	DHW setpoint (Temperatura di setpoint del sanitario)	V	°C / °F	°C / °F
108	006C	R	W	N/A	N/A		N/A	N/A
109	006D	R	W	N/A	N/A		N/A	N/A
110	006E	R	W	CH mode	Central heating working mode (Modo di funzionamento riscaldamento)		0: CH with thermostat; 1: CH with outdoor reset; 2: CH with full outdoor reset; 3: CH with permanent heat demand; 4: CH with 0-10 Vcc input	0: Riscaldamento con TA 1: Riscaldamento con sonda esterna; 2: Riscaldamento con sonda esterna e compensazione del TA; 3: Riscaldamento permanente; 4: Riscaldamento comandato da ingresso 0-10V
111	006F	R	W	DHW mode	DHW working mode (Modo di funzionamento sanitario)		0 = no DHW; 1 = DHW store with sensor; 2 = DHW store with thermostat; 3 = N/A; 4 = N/A; 5 = N/A	0 = Acqua sanitaria assente 1 = Bollitore con sensore 2 = Bollitore con termostato; 3 = N/A; 4 = N/A; 5 = N/A
112	0070	R		Supply temp	Supply temperature of the Burner 1 (Master) (Temperatura di mandata del Bruciatore 1 (Master))	V	°C / °F	°C / °F

113	0071	R		Return temp	Return temperature of the Burner 1 (Master) <i>(Temperatura di ritorno del Bruciatore 1 (Master))</i>	V	°C / °F	°C / °F
114	0072	R		DHW temp	DHW tank temperature <i>(Temperatura del bollitore)</i>	V	°C / °F	°C / °F
115	0073	R		Flue gas temp	Flue gas temperature of the Burner 1 (Master) <i>(Temperatura fumi del Bruciatore 1 (Master))</i>	V	°C / °F	°C / °F
116	0074	R		Heat exchanger temp	Header temperature <i>(Temperatura del collettore)</i>	V	°C / °F	°C / °F
117	0075	R		Firing rate	Firing rate on <u>appliances with one burner only</u> <i>(Potenza del bruciatore in <u>apparecchi monobruciatore</u>)</i>	V	%	%
118	0076	R		N/A	N/A	V	N/A	N/A
119	0077	R		Flame current	Flame current of the Burner 1 (Master) <i>(Corrente di ionizzazione del Bruciatore 1 (Master))</i>	V	uA	uA
120	0078	R		Water pressure	Water pressure <i>(Pressione acqua)</i>	V	bar/psi	bar/psi
121	0079	R		Analog in	0-10 Vcc analog input value <i>(Segnale di ingresso 0-10V)</i>	V	0..10,0V	0..10,0V
122	007A	R		NA	NA	V	N/A	N/A
123	007B	R		NA	NA		N/A	N/A
124	007C	R		CH pump	State of the Burner 1 (Master) motorized valve (if any) <i>(Stato della valvola motorizzata del Bruciatore 1(Master) (se presente)</i>	V	0 = Close 100 = Open	0 = Chiusa 100 = Aperta
125	007D	R		N/A	N/A	V	N/A	N/A
126	007E	R		N/A	N/A		N/A	N/A
127	007F	R		N/A	N/A		N/A	N/A
128	0080	R		N/A	N/A		N/A	N/A
129	0081	R		N/A	N/A		N/A	N/A
130	0082	R		N/A	N/A		N/A	N/A
131	0083	R		N/A	N/A		N/A	N/A
146	0096	R		Dependent 1 State	State of the Burner 1 (Master) <i>(Condizione del Bruciatore 1 (Master))</i>		2 = Stand by 9 = In burn 13 = Fan in post purge 15 = Post pumping	2 = In attesa 9 = In funzione 13 = Ventilatore in post ventilazione 15 = Pompa in post circolazione
147	0097	R		Dependent 1_Status	Status of the Burner 1 (Master) <i>(Stato del Bruciatore 1 (Master))</i>		0 = Stand by 16 = Heat demand	0 = In attesa 16 = Richiesta di calore
148	0098	R		Dependent 1_Error Code	Error code of the Burner 1 (Master) <i>(Errore del Bruciatore 1 (Master))</i>		See error list into the IOM	Vedere elenco errori nel manuale

149	0099	R		Dependent 1_Firing Rate	Firing rate of the Burner 1 (Master) (Potenza del Bruciatore 1 (Master))		%	%
150	0096	R		Dependent 2_State	State of the Burner 2 (Condizione del Bruciatore 2)		2 = Stand by 9 = In burn 13 = Fan in post purge 15 = Post pumping	2 = In attesa 9 = In funzione 13 = Ventilatore in post ventilazione 15 = Pompa in post circolazione
151	0097	R		Dependent 2_Status	Status of the Burner 2 (Stato del Bruciatore 2)		0 = Stand by 16 = Heat demand	0 = In attesa 16 = Richiesta di calore
152	0098	R		Dependent 2_Error Code	Error code of the Burner 2 (Errore del Bruciatore 2)		See error list into the IOM	Vedere elenco errori nel manuale
153	0099	R		Dependent 2_Firing Rate	Firing rate of the Burner 2 (Potenza del Bruciatore 2)		%	%
154	0096	R		Dependent 3_State	State of the Burner 3 (Condizione del Bruciatore 3)		2 = Stand by 9 = In burn 13 = Fan in post purge 15 = Post pumping	2 = In attesa 9 = In funzione 13 = Ventilatore in post ventilazione 15 = Pompa in post circolazione
155	0097	R		Dependent 3_Status	Status of the Burner 3 (Stato del Bruciatore 3)		0 = Stand by 16 = Heat demand	0 = In attesa 16 = Richiesta di calore
156	0098	R		Dependent 3_Error Code	Error code of the Burner 3 (Errore del Bruciatore 3)		See error list into the IOM	Vedere elenco errori nel manuale
157	0099	R		Dependent 3_Firing Rate	Firing rate of the Burner 3 (Potenza del Bruciatore 3)		%	%
158	0096	R		Dependent 4_State	State of the Burner 4 (Condizione del Bruciatore 4)		2 = Stand by 9 = In burn 13 = Fan in post purge 15 = Post pumping	2 = In attesa 9 = In funzione 13 = Ventilatore in post ventilazione 15 = Pompa in post circolazione
159	0097	R		Dependent 4_Status	Status of the Burner 4 (Stato del Bruciatore 4)		0 = Stand by 16 = Heat demand	0 = In attesa 16 = Richiesta di calore
160	0098	R		Dependent 4_Error Code	Error code of the Burner 4 (Errore del Bruciatore 4)		See error list into the IOM	Vedere elenco errori nel manuale
161	0099	R		Dependent 4_Firing Rate	Firing rate of the Burner 4 (Potenza del Bruciatore 4)		%	%
200	00C8	R		N/A	N/A			
201	00C9	R		N/A	N/A			
202	00CA	R		N/A	N/A			
203	00CB	R		N/A	N/A			
204	00CC	R	W	N/A	N/A	V		
205	00CD	R	W	N/A	N/A	V		
206	00CE	R	W	Spring outdoor temp	Spring outdoor temperature (parameter 2023 of the boiler) (Temperatura esterna primaverile (parametro 2023))	V	°C / °F	°C / °F

207	00CF	R	W	Spring supply temp	Spring supply temperature (parameter 2024 of the boiler) <i>(Temperatura di mandata primaverile (parametro 2024 della caldaia))</i>	V	°C / °F	°C / °F
208	00D0	R	W	N/A	N/A	V		
209	00D1	R	W	Winter supply temp	Winter supply temperature (parameter 2022 of the boiler) <i>(Temperatura di mandata invernale (parametro 2022 della caldaia))</i>	V	°C / °F	°C / °F
210	00D2	R	W	Warm weather shut temp	Warm weather shut down temperature (parameter 2020 of the boiler) <i>(Temperatura esterna di spegnimento del riscaldamento (parametro 2020 della caldaia))</i>	V	°C / °F	°C / °F
211	00D3	R	W	Night setback temp	Night setback temperature (parameter 2027 of the boiler) <i>(Temperatura di riduzione notturna (parametro 2027 della caldaia))</i>		°C / °F	°C / °F
212	00D4	R		N/A	N/A			
213	00D5	R		Outdoor temp	Outdoor temperature <i>(Temperatura esterna)</i>	V	°C / °F	°C / °F
214	00D6	R		N/A	N/A			
215	00D7	R		N/A	N/A			
216	00D8	R		N/A	N/A			

N/A = Not applicable (Non applicabile)