

AFFILIATED MEMBERS

PROCESS CONTROLS

Furnace Control Corp.

Marathon Monitors Inc.

TYPE: NM

8

Process-Electronic

*Optional

Manual #: 006

Rev No: 3 Date: 10 June 2015

THIS MANUAL IS SUPPLIED IN ONE (1) COPY.

No part of this publication may be duplicated, copied, and/or transmitted without the prior written permission of United Process Controls.

The information contained in this document is STRICTLY CONFIDENTIAL and PROPRIETARY to United Process Controls, and shall not be: i) reproduced or disclosed in part or in whole, ii) used for any design or manufacturing of heat treating and/or control equipment, or any other purpose except for that which it is supplied under the terms of the Contract, unless the express written authorization is obtained from United Process Controls.

Drawings and photographs included in the documentation are the property of United Process Controls, and it is strictly forbidden to reproduce them, transmit them to a third party, or use them for manufacturing and/or design of equipment. Sub-licensing of any technical information contained in this Documentation is strictly forbidden under the terms of the Contract.

United Process Controls reserves the right to modify this document without prior notice.

WARRANTY:

United Process Controls (UPC) warrants its goods as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to UPC during the period of coverage, UPC will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

CE Conformity (Europe)

This product conforms to 73/23/EEC, the Low Voltage Directive, and 89/336/EEC, the EMC Directive.

AMS Conformity (North America)

This product conforms to SAE Aerospace Material Specifications AMS 2759/10 for nitriding and 2759/12 for nitrocarburizing

For assistance please contact:	United Process Controls Inc.
	TEL: +1 513 772 1000 • FAX: +1 513 326 7090
	Toll-Free North America +1-800-547-1055
	upc.support@group-upc.com
	www.group-upc.com

TABLE OF CONTENTS

TABLE O	F FIGURES	4
1. INT	RODUCTION	5
1.1	Overview	5
2. GET	TING STARTED	6
2.1	Opening the software	6
2.2	Connection	7
3. Mo	dule Overviews	9
3.1	Utility Module	9
3.2	Furnace Model Module	13

TABLE OF FIGURES

Figure 1 – Startup interface	6
Figure 2 – Connection menu	7
Figure 3 – Ethernet Connection Interface	7
Figure 4 – Utility Main Interface	8
Figure 5 – User Field Adjustment Interface	9
Figure 6 – Communication Management Interface	10
Figure 7 – Configuration Backup Interface	11
Figure 8 – Configuration Restore Interface	12
Figure 9 – Furnace Model Overview	13
Figure 9 – Furnace Model Configuration Interface	14

1. INTRODUCTION

1.1 Overview

The H_2Smart^{TM} Studio software is used to connect, monitor and modify the H_2Smart^{TM} internal configuration. The software gives access to view the unit info, critical internal information such as sensor values, block temperature, pump flow, etc. Using the software, the user can edit the communication parameters for TCP/IP as well as for the optional communication buses.

The internal furnace model used to calculate KN and KC values can be both monitored and configured. The real time flow inputs to the furnace model can be set and monitored.

If the unit configuration has been altered from the factory settings, the unit configuration can be both backed up and loaded using the software.

2. GETTING STARTED

2.1 Opening the software

The H_2Smart^{TM} unit comes with either a CD or a USB memory stick containing the H_2Smart^{TM} Studio software. Insert the media into your computer and double click the H2SmartStudio shortcut. The software will start and the window below will appear.

H2Smart Studio	
Communication Help	
	ii.

Figure 1 – Startup interface

2.2 Connection

To connect to the H_2Smart^{TM} unit, with the H_2Smart^{TM} Studio software you must connect the included Ethernet adaptor to the H_2Smart^{TM} unit. Connect your PC to the H_2Smart^{TM} unit using a network switch or a crossover network cable. Your PC will need to be in the same IP subnet to connect to the unit. Open the Communication menu to enter the IP address of your H_2Smart^{TM} unit.

H2Smart Studio	 x
Communication Help	
Connect via Ethernet	
Connect via Service Port	

Figure 2 – Connection menu

Device IP Address:	192.168.6.240	Port No:	51973 🔻		
Detect Device II	P Address				
Range Begin: 192.	168.6.1]	Range End:	192.168.6.254	
				Detect	
IP Address	Port No	Firm	nware Ver		
Court for Faiture	llee				

Figure 3 – Ethernet Connection Interface

192, 168, 6, 240				
 Utility User Fields Adjustments Communication Manage Maintenance Save Config Data Load Config Data Load Config Data Configuration 	Unit Info Serial No: 925310 Firmware Ver: 15.4.10 H2 Sensor H2: 0.00 % CAN Bus Node ID: 125 Status: Pre-Operational Block TBlock: 28.679 °C YBlock: 100 % Controller: ON	Pump Flow: 0.00 SLM Pum Y: 0 % Controller: ON	Heat Tracing TAux: 50.54 YAux: 0 Controller: ON	No expansion card
	Signals DigIn Sampling Enabled Sampling Enabled	Alarms Pump Saturation Flow Off Limits	□ TCS Break □ Ri Test Alarm	EEPROM corrupted
Disconnect				

Figure 4 – Utility Main Interface

3. Module Overviews

3.1 Utility Module

The Utility module of the *H*2*Smart*[™] *Studio* software is used to view the unit status, adjust the sensor reading, set up the communication interfaces and save or load configuration data.

On the main utility module interface as shown in Figure 4 above, the unit's serial number, firmware revision and operating status is shown.

3.1.1 User Field Adjustment

The User Field Adjustments module, as shown in Figure 5, should only be used by a qualified United Process Controls service technician, or my qualified maintenance personnel trained in the use of the optional H_2Smart^{TM} Field Adjustment Kit. Improper entry of values into these fields can void the factory calibration, or cause the unit to perform erratically.

H2Smart Studio							— — X
192. 168.6.240							
 Utility User Fields Adjustments Communication Manage Maintenance Save Config Data Load Config Data Load Config Data Configuration 	H2 Sensor Actual Scale Factor: Offset:	Value: 1.00 0.00	0.00 %	8			
Disconnect		Save		Re	evert	Restore Factory	/ Defaults

Figure 5 – User Field Adjustment Interface

3.1.2 Communication Management

The H_2Smart^{TM} Communication parameters can be configured in the Communication Management interface as shown in Figure 6. These values should be configured for integration into a furnace control or SCADA system. The unit's IP address can also be set for integration into your plant LAN. These values take effect when the H_2Smart^{TM} unit is rebooted.

nmunication Help				
92.168.6.240				
 Utility User Fields Adjustments 	CAN Baudrate:	125 kBd	 Modbus Address: 	2
Maintenance Save Config Data	Node Id:	125	Daudrate:	38400Dd 👻
Load Config Data	Cata Format:	iHS06 compatible	▼ Data Bits:	8 -
Configuration	Autosend:	Off	 Parity: 	Even •
	LAN		Stop Bits:	-
	IP Address:	192.168.6.240	Mode:	4-Wre 🔻
	Default Gateway:	192,168.6.1	DP State:	WAIT_PRM
	Primary DNS:	192.168.6.2	Baudrate:	12 MBaud
	Secondary DNS:	0.0.0.0	Configuration: Address:	Basic
	DHCP:	Off	Operation Mode:	H2Smart •
	DCS Group:	0	Kn Selection:	(Kn 🔻
Disconnect	Save		Revert	testore Factory Defaults

Figure 6 – Communication Management Interface

3.1.3 Maintenance

If the H_2Smart^{TM} configuration is modified from the factory setup, the configuration can be saved for quick restoration in the event of a unit replacement. The Save Config Data interface can be used to save the configuration of the unit to your PC.

ommunication Help			
Initiation Perp Identify User Fields Adjustments Communication Manage Maintenance Save Config Data Load Config Data Furnace Model Configuration	Configuration Saving File Path:	Choose Save	
Configuration			

Figure 7 – Configuration Backup Interface

Click the Browse button to select the path on your computer where you wish to store the configuration backup. You must give the file a path and name before the save button will become active. A *.cfg file will be created on your computer at the specified path. You can move this file to another location for archiving if desired.

The configuration can be restored using the Load Configuration Data interface shown in Figure 8 below. This operation will load the unit with a stored configuration. Once this operation is performed the previous configuration cannot be retrieved unless it was backed up separately.

mmunication Help		
192.168.6.240		
 Utility User Fields Adjustments Communication Manage Maintenance Save Config Data Load Config Data 	Configuration Loading File Path:	Choose
 Furnace Model Configuration 		

Figure 8 – Configuration Restore Interface

3.2 Furnace Model Module

minuncation Help		
192.168.6.240		
 Utility User Fields Adjustments Communication Manage Maintenance Save Config Data Load Config Data Fumace Model Configuration 	Model Inputs Gas Flow NH3: 0.836 m3/h CO2: 0.000 m3/h N2: 0.000 m3/h Furnace Temperature: 585 °C O2 Probe EMF: 1260 mV H2 Reading: 58.15 % Recalculate Model	Model Outputs Furnace Atmosphere [%] CO: 0.00 % H20: 0.00 % CO2: 0.00 % NH3: 29.94 % CH4: 0.00 % H2: 57.18 % O2: 0.00 % Furnace Parameters Simplyfied Model Diss: 70.06 Kn: AC: Pe+00 KC: Pe+00 KO: 2e-03 LogpO2: -30
Disconnect	Ĩ	

Figure 9 – Furnace Model Overview

The furnace model operation parameters can be viewed though the furnace model overview. The model inputs can be verified using this interface. The model gas flow inputs are shown. These values are as set via the industrial communication bus or via the furnace model configuration.

The furnace model calculations are shown on the right side of the screen.

mmunication Help													
192. 168.6.240													
 Utility User Fields Adjustments Communication Manage Maintenance Save Confin Data 	Process G	Process Gas Composition [%] and Default Gas name CO CO2 CH4 H2 H					rFlow H2O NH3 N2 O2			Flow		CO: 0.021090	
Load Config Data												CO2:	0.312820
 Furnace Model Configuration 	CO2	0	100	0	0	0	0	0	0	0.00	m3/h	CH4:	-0.398920
	1											H2:	0.000000
												H2O:	0.184360
	NH3	0	0	0	0	0	100	0	0	0.00	m3/h	NH3:	-0.032520
	N2	0	0	0	0	0	0	100	0	0.00	m3/h	N2:	0.000000
		<u>î</u>	Î.									02:	0.000000
	Furnace Start Content												
	co:	0	% H	120:	0	%	Temp. Source:		Opt. Input Module 👻				
	CO2:	0	6	N2:	100	%	D	efault 1	Temp.:	530.0	°℃		
	CH4:	0	6	02:	0	%	Fur	Furnace Volume:		9.0)0 m3		
	H2:	0 9	% N	IH3:	0	%							
Disconnect	Save							Rever	t	Restore	estore Factory Defaults		

Figure 9 – Furnace Model Configuration Interface

The furnace model configurations can be set through the Furnace Model Configuration Interface. The furnace model configuration should be set at the factory and should not be modified.

Reach us at www.group-upc.com

United Process Controls brings together leading brands to the heat treating industry including Waukee Engineering, Furnace Control, Marathon Monitors and Process-Electronic.

We provide prime control solutions through our worldwide sales and services network with easy-toaccess local support.

UNITED PROCESS CONTROLS INC. MARATHON MONITORS PLANT 8904 Beckett Rd., West Chester, OH 45069 USA

Phone: +1-513-772-1000 Fax: +1-513-326-7090 E-mail: <u>upc.sales@group-upc.com</u>



