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# 1. PURPOSE

UFM Manager is a piece of PC software that allows communication between the FGM160 flare gas meter and a service computer. This document describes how to use UFM Manager at Basic and Operator level.

# 2. TERMS AND DEFINITIONS

FGM160 – Fluenta Flare Gas Meter Model 160

# 3. RESPONSIBILITY

The Service Manager takes overall responsibility for this manual. This includes validity of the document, as well as informing all required resources about its meaning, significance and any changes that are made to it. All service engineers within the Fluenta organization are responsible for proper usage of UFM Manager.

# 4. UFM MANAGER – LOGGING IN

When run for first time, UFM Manager asks for a license. A license file is issued by Fluenta, allowing the user to create a new account. Once a new account has been set up, a new user can be created. To do this, please input a name, password and confirm the level of access (basic or operator). Access level can be found on the license file. Before login, the user's PC should be physically connected to FGM. To log in one needs a slave ID for the FGM and a COM port (default slave ID is 1, the COM port number depends on RS485 port settings).



Fluenta UFM Manager					
Meter Information	Meter Configuration	Service and Troubleshooting	Help Calibrations	Refresh	English
					Log In
	Us	er Name jack		•	
		,			
	Pa	assword			
			Forgot	t password?	
	SI	ave ID 1			
	C	OM Port COM34		•	
			Login		
	Use the system	without a Licence File		Upload Licence	

# 5. UFM MANAGER – BASIC LEVEL

Basic level gives access to the following options:

- Dashboard
- 10-day totalizers
- Data logging
- System configuration
- Help/About Fluenta UFM Manager



## 5.1 Dashboard

The dashboard gives an overview of the basic live flow parameters and system indicators.

🕞 Fluenta UFM Manager							_	- 🗆 X
Meter Information	Meter Configuration	Service and Troubleshooting	Help	Calibrations		Refresh		English 🔻
	Svetem Infr	vmation					Dasht	ooard
	Serial Num	ber: 2006-0065						
	Installation	: Sandbrekkeveien 85		Company: F	FLUENTA AS			
	Tag Numbe	er: 01-FLUENTA-100		Description: 1	12" HP			
Velocity		0.000 m/s				System 1		
Act Volume Flow		0.00 m³/h		Measureme	nt Alarm	$\oslash$		
Std Volume Flow		0.00 Sm³/h		Flow velocity	y Alarm	$\oslash$		
Mass Flow		0.00 kg/h		Velocity of S	Sound Alarm	$\oslash$		
Total Mass		314548 kg		Density Alar	m	$\oslash$		
Velocity of Sound		349.39 m/s		Temperature	e Alarm	$\oslash$		
Pressure		1.01300 BarA		Pressure Ala	arm	$\oslash$		
Temperature		20.00 ° Celsius		Gas Compo	sition Alarm	$\oslash$		
Total Act Volume		644374.438 m³		QoS Warning	g	$\oslash$		
Total Std Volume		633383.875 Sm³		QoS Alarm		$\oslash$		
Density		1.02 kg/m3						
Save live data								

Figure 2: Example of the UFM Manager dashboard



#### 5.2 10-day Totalizers

The 10-day totalizers screen gives you an overview of last 10 days of accumulated:

- Standard volume
- Actual volume
- Mass

It is also possible to save the 10-day totalizers to a CSV file with a button on the bottom of the screen.

🕞 Fluenta UFM Manager					- 🗆 X
Meter Information	Meter Configuration	Service and Troublesho	ooting Help	Calibrations	Refresh 🕕 English 🔻
					10 Day Totalizers
	Accumulated Standard Volume [Sm³]	Accumulated Actual Volume [m³]	Accumulated Mass [kg]	Start Time	24h Acc. Reset Time
Current 24h period	97.63229	99.32644	52.73875	8:03:12	0:00:00
(Last-1) 24h period	79.93439	81.32142	43.18126	8:01:18	Note: When the volume/mass unit
(Last-2) 24h period	14105.27	14350.05	6889.782	0:00:00	the previous totalizers are not recalculated
(Last-3) 24h period	36808.55	37451.07	17974.27	0:00:00	
(Last-4) 24h period	39583.75	40291.26	19332.07	0:00:00	
(Last-5) 24h period	31882.86	32434.45	15542.9	0:00:00	
(Last-6) 24h period	5501.667	5597.136	2673.224	0:00:00	
(Last-7) 24h period	1818.277	1849.827	882.2085	0:00:00	
(Last-8) 24h period	576.2049	586.2034	279.2377	0:00:00	
(Last-9) 24h period	1460.572	1485.911	708.71	0:00:00	
(Last-10) 24h period	4165.512	4237.795	2024.59	0:00:00	Save 10 Day Totalizers

Figure 3: Example of the 10-day totalizers screen



#### 5.3 System Configuration

This page allows you to change:

- System configuration (single, dual)
- Instrument time (this can be set manually, or synchronized with PC)
- Units used for flow values
- Pipe internal diameter
- Theoretical transducer distance
- Standard temperature
- Standard pressure

It is also possible to import system settings as a config file.

Pluenta UFM Manager						-		×
Meter Information Meter	Configuration Ser	vice and Troubleshooting	Help Calibrati	ions	Refresh		English	•
				Syste	em Cor	nfigura	ation	
System Configuration:	Single system(ch1)	<ul> <li>Serial Nur</li> </ul>	nber	2006-0065				
Instrument Time (HH:mm:ss DD.MM.YYYY)	09:34:06 10.05.2024	PC Time		09:34:05 10.05.20	024			
24h Accumulation reset time	0:00:00	_		Synchronize time	with PC			
Velocity unit setup	m/s	<ul> <li>Calculation p</li> </ul>	arameters:					
Volume unit setup	m³	•						
Volume flow unit setup	m³/h	<ul> <li>STD Temp</li> </ul>	erature [ºC]	15				
Mass unit setup	kg	<ul> <li>STD Press</li> </ul>	sure [barA]	1.01325				
Mass flow unit setup	kg/h	<ul> <li>Viscosity</li> </ul>	-	0.000015				
Pressure unit setup	BarA	▼ Flow veloc	city threshold [m/s]	0.05				
Temperature unit setup	° Celsius	<ul> <li>Pipe Int. D</li> </ul>	lia. [m]	0.325				
		Theo. tran	s. dist. [m]	0.4596197				

Figure 4: Example of system configuration settings



#### 5.4 Help/About Fluenta UFM Manager

This page shows helpful information including System information, license information, system users and software information.

er Information Meter Configuration	Service and Troubleshooting	Help Calibrations	Refresh 🕕 Engli
		About Fl	uenta UFM Manage
System Information	Sy	stem Users	
Fluenta Flare Gas Monitor		Current Users	
Model: FGM260			
Serial Number: 2006-0065		(Internal)	
DSP Version: 1.01			
Description: 12" HP			
Company: FLUENTA AS			
Installation: Sandbrekkeveien 85			
Tag Number: 01-FLUENTA-100			
			Add User
Licence Information			
Customer:			
Licence Expires: 01/02/2028 (1361 d	avs remaining)		Software Information
	-,;-		Fluenta UFM Manager
Access Level: Internal			
Access Level: Internal Logged In User: (Internal)			Version: 5.3.0

Figure 5: Example of the help page



# 6. UFM MANAGER – OPERATOR LEVEL

Operator level is an expansion of Basic level with some additional options.

These include:

- Analog outputs
- Input configuration
- Flowmeter alarms
- Modbus configuration
- Other outputs
- Graphs and live data

### 6.1 Analog Outputs

This page gives you the possibility to configure and set the values of the analogue outputs. Each output can be configured according to user's requirements.

🕞 Fluenta UFM Mana	ager							-		×
Meter Information	n Meter	Configuration	Service and Troublesh	ooting	Help	Calibrations	Refresh		English	•
							Analog	ue Out	puts	
						Enable / Disable				
CL1 variable:	Test Value	e <b>v</b>	Test value:	0		-				
CL2 variable:	Test Value	e •	Test value:	0		-				
CL3 variable:	Test Value	• •	Test value:	0		-				
CL4 variable:	Test Value	e v	Test value:	0		-				
CL5 variable:	Test Value	e 🔻	Test value:	0		-				
CL6 variable:	Test Value	• •	Test value:	0						
	Scale	Offset	4 mA		20 mA					
CL1 setup: 1.0092	259	-0.07569792	4	20		-				
CL2 setup	52	-0.02973234	4	20						
CL3 setup: 1.0092	285	-0.07811811	4	20		-				
CL4 setup: 1.0059	96	-0.1161838	4	20		-				
CL5 setup: 1.0057	732	-0.0915106	4	20		-				
CL6 setup: 1.0042	217	-0.06526846	4	20		-				

Figure 6: Example of the Analogue Outputs page

## 6.2 Input Configuration

This page allows you to set up the type of pressure and temperature inputs (HART, current loop, or fixed at standard). Each input can be set up according to requirements. For HART inputs, it is possible to set different input modes for the transmitters (single, dual, or double).

FLUENTA

🖻 Fluenta UFM Manager – 🗆 X										
Meter Information Meter Cont	figuration Service and Troubleshooting	Help Calibrations	Refresh 🕕 English 🔻							
			Input Configuration							
Pressure input type	Fixed at STD 🔻									
Temperature input type	Fixed at STD 🔻									
Current loop pressure setup	Scale 0.9854386	Offset								
Current loop pressure range [barA]	4 mA	20 mA 3								
Current loop temperature setup	Scale	Offset								
Current loop temperature range [K]	4 mA 273.15	20 mA								
HART pressure input setup	Single-Transmitter 1 (poll addr. 1) 🔹									
HART temperature input setup	Single-Transmitter 1 (poll addr. 2) 🔹									
Dual sensor variable selector:	Primary Variable 🔻	Secondary Variable 🔻								
P and T fallback values	P fallback value [barA] 1.01325	T fallback value [K]								
Enable CL Pressure	-									
Enable CL Temperature	-									
Enable Modbus Pressure	-									
Enable Modbus Temperature	-									

Figure 7: Example of the Input Configuration page



#### 6.3 Flowmeter Alarms

This page allows configuration of the flow meter alarms. The user can configure the range for temperatures [K], pressure [BarA], sound velocity [m/s], flow velocity [m/s], quality of signal warning threshold, and quality of signal alarm threshold.

🖻 Fluenta UFM Manager						– 🗆 X
Meter Information	Meter Configuration	Service and Trou	bleshooting Help	Calibrations	Refre	sh 🕕 English 🔻
					Flowr	neter Alarms
Temperature [K]	268.15	348.15				
Pressure [barA]	0.5	3				
	Syst	em 1		Syst	tem 2	
	Minimum	Maximum	Maximum Change	Minimum	Maximum	Maximum Change
Sound velocity [m/s]	250	500	70	250	500	70
Flow velocity [m/s]	0	100	70	0	100	70
QoS Warning Threshold		200			0	
QoS Alarm Threshold		200			0	

#### Figure 8: Example of Flowmeter Alarms page



#### 6.4 Modbus configuration

This page allows the user to configure the DCS Modbus port. All settings can be altered so that match the DCS Modbus link.

🕞 Fluenta UFM Manager							_		
Meter Information	Meter Configuration	Service and Troubleshooting	Help C	Calibrations	Refre	esh		English 🔹	
					Modbus	Con	figura	tion	
Enable Modbus	-	Termination							
Modbus mode	RTU	▼ TX enable dela	y [ms] 1						
Baud rate	19200	<ul> <li>DCS port slave</li> </ul>	address 22	4					
Parity	even	v							
Register base address	1000	Service port con	figuration:						
Register size in request	32 bit	<ul> <li>Service port sla</li> </ul>	ave address 1						
Byte ordering	DCBA	<ul> <li>Termination</li> </ul>							
Register spacing	1	•							
Data bits (auto)	8	•							
Stop bits (auto)	1	•							

Figure 9: Example of the Modbus Configuration page



#### 6.5 Other outputs

This section allows for the configuration of all additional outputs. These include pulse, frequency, or HART. Available parameters for pulse/frequency are: scale, offset, range scale, range offset, and test value. For HART, it is possible to choose four different process variables and HART output addresses.

🕞 Fluenta UFM Manager						- 🗆 X
Meter Information	Meter Configuration	Service and Troubleshooting	g Help	Calibrations	Refresh 🕕	English 🔻
					Other Ou	Itputs
Pulse/Freq1 mode:	Pulse 🔻	Variable: Test value	<b>v</b>	Polarity: Active H	ligh Pulse 🔻	
Pulse/Freq2 mode:	Frequency 🔻	Variable: Test value	•	Polarity: Active H	High Pulse 🔻	
	Frequency scale	Frequency offset	Range scale	Range offset	Test value	
Pulse/Freq1 setup:	1	0	1	0	0	
Pulse/Freq2 setup:	1	0	1	0	0	
Enable Pulse/Frequency	: Output 1:	Output 2:				
Pulsewidth active	1					
Pulsewidth passive	10					
Poll adr:	1					
Enable HART:						
HART variables:	I	Primary Var		Tertiary Var		
	Volume Flowrate a	t Reference Conditions 🔹	Mass Flowrat	e	•	
	S	econdary Var		Quaternary Var		
	Volume Flowrate a	at Actual Conditions 🔹	Gas Flow velo	ocity	•	

Figure 10: Example of the Other Outputs page



#### 6.6 Graphs and live data.

This section allows users to collect ultrasonic signals from the flow computer. The obtained signals can then be saved as text files for further troubleshooting. This can be done for both single and dual-path systems. It is also possible to plot up to four process variables in real time.

To save a signal graph to a file, click 'save to file'. The default save location is the installation folder for UFM Manager).



Figure 11: Example of the graphs and live data page, with the 'save to file' button highlighted

#### 6.7 Health Check

An automatic module allows user to collect flow meter data that can be used for health assessment and troubleshooting of the flow computer. The Health Check requires an Operator or higher level of access. The module is enabled via log in page.

Once started, the module requires user to select the COM port and a path to the directory that will store all data (this means that the location must be usable for the program). After that, an automatic process can start. This will run each test in an order and collect the data. Every step progress is described in the log window. It is also possible to run manually each of the steps or only the selected ones. Once the test is passed and finished, a checkbox will appear next to the test indicating it is finished. The automatic process takes around 30 minutes, after that the program will indicate that the data must be zipped and sent to support@fluenta.com for evaluation.



Tests run during health check:

- Communication test tests if the flow computer is online and reachable
- Configuration the program collects config data
- History the module collects config changes history
- Signals the program will attempt to collect and plot ultrasonic signals, there will be 3 sets of signals collected
- Log data the program will collect 10 minutes of flow measurement data to assess the performance
- Live data collects current live data for the process

🖲 Fluenta UFM Manager						- 🗆 X
Meter Information Mete	er Configuration Service	e and Troubleshooting	Help	Calibrations	Refresh	► English ▼
				Health check		Log In
				Calibration with Flare	Cal	Log III
	User Name	jack		*		
	Password					
				Forgot password?		
	Slave ID	1				
	COM Port	C0M34		•		
			Login			
	Use the system without a Licence File			Upl	oad Licence	

Figure 12 Access to Health check



🖻 Fluenta UFM Manager				-		
Meter Information	Meter Config	uration	Service and Troubleshooting Help Calibrations	Refresh 🕞	English	
Slave ID				Health ch	ıeck	
1				Send the data to support@fluenta.com		
COM port COM 🔻	Select directory		Start health check	Open directory		
Communication	Run test	Ο				
Configuration	Run test	Ο		×		
History	Run test	0	Welcome to the Health Check feature. Please follow the instructions below and those which will appear			
Signals	Run test	0	Before the Health Check starts, close all unrelated error message windows.     The Health Check will last up to 30 minutes.     Solet a discharger source the Messille Check which does not			
Log Data	Run test	0	<ul> <li>Spect a diministrator rights or run UMM Manager as administrator.</li> <li>Any issues arising during the test should be reported to FL Support.</li> </ul>			
Live Data	Run test	Ο	ОК			
			No data to plot			



# 7. HOW TO

This section instructs the user how to perform common tasks with the UFM Manager software.

## 7.1 Obtaining a Service Connection

In order to obtain a service connection, the RS485 port must be used. In order to do this, a USB to RS485 converter is needed. A COM port number must then be specified according to Windows Device Manager. It is important to make sure the COM port is set to RS485 with correct mode (two or four wires). It is also important to observe correct wiring. The Tx and Rx pairs/wires must be crossed and the COM port connection must be wired according to the serial converter manufacturer instructions.



Figure 14: Service connection with FGM160 - two wire connection





Figure 15: Service connection with FGM160 - four wire connection.

#### 7.2 Configuring and Analogue Output

Each analogue output needs to be set with a parameter selected from the drop-down list. The field enable/disable option allows you to activate the output. This will be green when active. Each active output needs a minimum and maximum range, which should be entered in the appropriate fields.

#### 7.3 Configuring an Analogue Input

When the temperature and pressure transmitters are connected to the FGM, the type of connection must be chosen from the drop-down list (HART, current loop, or fixed at standard). For analogue input, an option "Enable CL pressure" or/and "Enable CL temperature" should be switched on (green colour). For analogue input it is also important to set the range that matches the transmitters (pressure is in bars and temperature is in Kelvins).

#### Gauge Pressure

If a customer installs a gauge pressure transmitter instead of absolute, the pressure range must by offset by 1.01325 bar in order to obtain absolute reading. This is important as the FGM160 uses only absolute readings. By applying the offset, the pressure reading is then treated as absolute. Please note that this workaround will affect the accuracy of the meter as the offset value is constant, where gauge pressure is the difference between ambient and process.



### 7.4 Changing Modbus Parameter

Most modbus parameters can be selected from the drop-down list. It is important to match the settings of the modbus port with the DCS serial link.

#### 7.5 Troubleshooting the Service Connection

If there is no service connection with the FGM160, the following checks must be performed:

- FGM is physically connected to your PC/laptop
- FGM is energized
- Proper connection was chosen (2- or 4- wire) for your adapter in system settings (this will depend on physical connection)
- COM port chosen for UFM is not used by any other application
- The license for UFM Manager is valid
- Proper slave address for FGM160 was chosen (default is 1)

#### 7.6 Adding new license

In order to add a new license to the program, the user needs to go to Help -> Service Engineer Login. This allows uploading new license file in case the program already has a valid license in the system. It is important to note that the new license will overwrite the access level (for example if current license allows user to log in as an Operator, uploading a Basic level license may only allow user to log in as a Basic user).

#### 🕞 Fluenta UFM Manager



# 8. REFERENCES

72.120.304 – FGM 160 Functional description 62.120.001 – FGM 160 Installation and Hook-up instructions