€xplorer FT

Electronic
Volume Conversion
Device

Pietro Fiorentini®

€xplorer FT

> Electronic Volume Conversion Device

Description

€xplorer FT is a PTZ volume conversion, compact and integrated, designed to satisfy needs of deregulated markets. It is a custody transfer dedicated to fiscal metering and volume conversion according EN 12405 regulation.

€xplorer FT has following approvals:

- NMi: Netherlands Meetinstituut N. T5928 (obtained on July 29th, 2002).

€xplorer FT is available in a wide product range according with options regarding: power supply, remote communication and range for pressure transducers.

Options for power supply/remote communication:

- Battery operated with battery life up to 5 years (@20°C);
- AC Main power supply with TeleSender Interface equipped with PSTN modem;
- AC Main power supply with TeleSender Interface equipped with GSM modem;
- Solar power supply with TeleSender Interface equipped with GSM modem.

And according with following range for integrated pressure transducers (one for metering and the other one, optional, to monitor inlet pressure):

- Absolute Pressure: 2 bar – 3.5 bar – 7 bar – 10 bar – 21 bar;
- Gauge Pressure: 35 bar – 75 bar - 100 bar.

Volume Conversion

€xplorer FT make conversion from measured volume (V_m) to base volume (V_b), that is the volume at reference conditions, using the AGA7 formula as follows:

$$V_b = V_c \times \frac{P}{P_b} \times \frac{tb + T_0}{t + T_0} \times \frac{Z}{Z_b}$$

Where:
V_b is the volume at reference conditions;
V_c is the corrected volume at working conditions ($V_c = V_m x[100/(100+Err\%)]$;
V_m is the measured volume at working conditions;
Err% is meter error percentage at frequency conditions;
p is the gas pressure;
P_b is the reference pressure;
t is the gas temperature;
t_b is the reference pressure;
T_0 is 273,15K;
Z is the compressibility factor;
Z_b is the reference compressibility factor;

So we can define Conversion Factor (C) as follows:

$$C = \frac{V_b}{V_c} = \frac{P}{P_b} \times \frac{tb + T_0}{t + T_0} \times \frac{Z}{Z_b}$$

Compressibility Factor (Z) is calculated according the following algorithms (user selectable):
AGA-NX19 mod.
ISO12213-3: 1997 (SGERG91)
AGA8 gross 1
AGA8 gross 2

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Data Logging

Measured and calculated variables (like pressure, temperature, measured volume, base volume, diagnostics and so on) could be selected to be logged according user set up.
Using X_Term configuration software It is possible to set up logging parameters. You can set up logging frequency and strategy:

- Frequency: from 1 second up to 8 hours, daily, monthly;
- Strategy: average, statistics (min, max, σ).

Memory buffer is larger than 100'000 records giving to users the possibility to monitor long time periods. Memory management could be chosen between filling strategy (when memory is full logging is stopped) or rolling strategy (when the memory is full the oldest records are overwritten).

Events and Alarms

€xplorer FT can manage events and alarms according with user set up, like threshold crossing, digital status change, etc.

Each variable could be set individually in order to generate an event, an alarm or both. Events and alarms are logged in two different buffers with up to 1000 records for each.

When an alarm is raised **€xplorer FT** starts a phone calls sequence according with set up.

Events and alarms configuration is possible using X_Term terminal software.

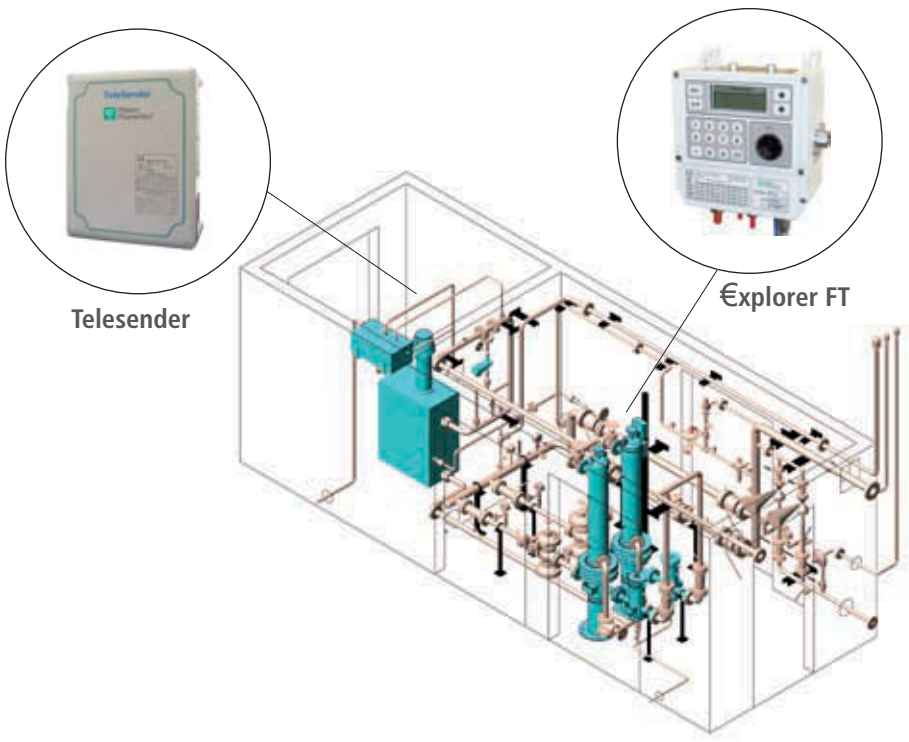
Communication

€xplorer FT communication is made through serial port and/or Infrared interface (IrDA). Supported communication protocols are Modbus ASCII Slave.
Communication with a remote Control Centre (like a SCADA or a DCS) is possible through an external modem (GSM or PSTN) installed on TeleSender devices installed in Safe Area.
A secondary serial port is available for custom applications.

Human-Machine Interface

€xplorer FT Human-Machine interface is composed by a membrane keyboard (16 keys) and a LCD Display (2x16 characters).

€xplorer FT set up is guided by simple and self explained menus. Of course, metrological parameters (values used in Base Volume calculus) are protected by a sealed button and a password in order to guarantee the integrity of fiscal parameters.



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Installation

€xplorer FT is designed to be installed in **Hazardous Area** and It is compliant with intrinsic safety regulation type **Eex ia IIB T4** (approval: CE INERIS N. 03ATEX0017X).

II 1 G , EEx ia IIB T4, Temperature: - 20 °C ÷ + 60 °C

TeleSender accessories, for power supply and remote communication, must be installed in Safe Area!

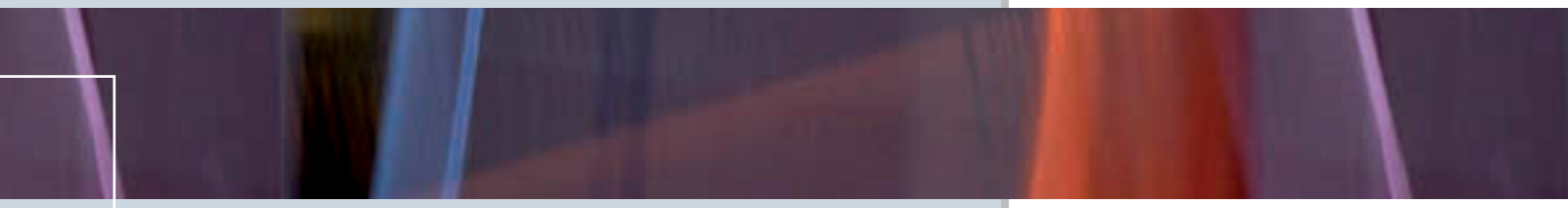
Configuration Software

X_Term is an application software designed to interface with **€xplorer** Family products in order to visualize data, configure devices and download logs.

Logged data could be downloaded in ASCCI files, with separators, in order to allow an easy use with spreadsheets.

Connection between **€xplorer** and PC is made through IrdaSender interface (on infrared port) or through a TeleSender device.

X_Term works on Microsoft Windows 95, 98, NT, 2000 and XP.



Technical specification

Operating temperature:	-20°+60°C
Mounting:	wall mounting or pole mounting;
Size:	155 x 157 x 82 mm;
Case:	UNI 5075 (EN 46000) Aluminium - enclose classification IP65 (EN 60529)
Pressure Transducers:	Accuracy: 0,1% of reading (@20°C); Stability: 0,1% of full scale per year; Thermal Drift: 0,1% of reading; Over pressure: 200%; Pressure connector: 1/4" conic female ISO7/1RC connector – INOX AISI 316 steel;
Temperature sensor:	4-wires PT100 with 3m armoured cable – 1/2" female pocket (ISO 228/1) must be used; Accuracy: ± 0.15°C; Thermal Drift: 0,1% of reading; Input range: -20°C + 50°C; Sensor Element: Ø = 8mm/L =180mm;
Counter Input:	2 counters, reed or open collector input (both LF or HF);
Digital Input:	2 digital input for remote control applications;
Digital Output:	2 digital output for signal repetition;
BackUp battery	a Lithium battery guarantees RAM integrity up to 6 months;

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