

## FLOW-X

# Flow computer for custody metering solutions

### Flow computing excellence

- Reduced planning and installation costs thanks to standard configurations
- Very exact flow conversion due to several calculation cycles per second
- High reliability thanks to independent modules with their own volume conversion and storage of measured values, counter readings, and events
- Systems are easy to extend thanks to modules with standardized inputs/outputs that are fully configurable via software
- Very simple operation thanks to intuitive user interface featuring identical menus and displays on the device and in the control room
- Reduced service and maintenance costs with tamper-proof remote maintenance
- Cost-efficient and flexible system integration of multiple measuring distances



# The perfect combination – Flow-X and FLOWSIC600-XT

The ultrasonic gas flowmeters in the FLOWSIC600-XT series have been setting standards in terms of design, usability, and reliability for many years. The Flow-X flow computer complements the FLOWSIC product series perfectly. It offers next generation technology, both in hardware and

software, and also promotes an intuitive user interface. The Flow-X series is based on powerful, single-stream modules that can be combined in various housings depending on the application.



# Flow-X – Flow computing excellence

## The perfect combination

To ensure the commissioning process runs quickly and smoothly, the flow computers in the Flow-X family come complete with predefined parameterization settings for standard gas measurement applications in combination with FLOWSIC600-XT ultrasonic gas flow measuring devices.

## Sophisticated user interface

The Flow-X offers a compelling user interface that can be operated using the touchscreen on the device or even via the integrated web server. The colored icons and menu texts create an entirely intuitive user experience to make operation and configuration of the Flow-X remarkably simple.

## Reliable gas volume conversion

The Flow-X offers gas volume conversion in accordance with MID requirements and is based on leading edge hardware with its 64-bit double-precision processor. Conversion cycles of no more than 250 ms ensure that volumes are calculated with the utmost precision.

## Outstanding versatility

Each module offers advanced measurement technology in combination with a high storage capacity and data communication functions. Even the process of adding a new measuring stream is straightforward: Simply install the module and update the parameterization settings for the Flow-X – that's all there is to it.

## Data logging

Every Flow-X module has a large internal memory (1 GB) for logging operations, events, and primary data.

## Remote access

It is as easy to access the device via the integrated web server (support for secure protocols) as it is via the touchscreen on the device itself. This means the Flow-X can be operated in exactly the same way no matter whether the user is in the control room or standing in front of the device.

Flow-X/P4



The Flow-X/P flow computer is installed in the instrument panel and allows the integration of up to four measuring streams. Flow-X/P offers an additional module with a 7-inch color touchscreen and multi-language support as well as a further three serial interfaces and two Ethernet interfaces.

Flow-X/C



The Flow-X/C flow computer is the ideal solution for single measuring streams. It can be installed in the instrument panel with ease. Flow-X/C offers a 7-inch color touchscreen with multi-language support, three serial and two Ethernet interfaces, and analog and digital ports for field devices. The integrated web server makes it possible to view, operate, and configure the Flow-X/C via a web browser – including via a secure connection in the case of remote access.

Flow-X/S



The Flow-X/S is designed for the integration of a single measuring stream and is housed in a DIN-rail enclosure. It features direct screw terminals for field connections in addition to two Ethernet interfaces with an integrated web server via RJ45 connection technology. The LCD screen displays the measured and calculated data in various languages over 4 lines.

# FLOW-X

## The ideal flow computer for gas metering



### Product description

The Flow-X flow computer provides gas volume conversion, event logging, parameter logging, and reports using state-of-the-art technology. Identical modules are combined in different housings, offering a multi-stream version Flow-X/P for 1–4 measuring distances with a local touch screen, or the Flow-X/S version for smaller installations with one measuring distance. Each module combines high-precision

measurement technology, fast digital signal processing, abundant processing power, versatile data communication, and high storage capacity in a fully equipped flow computer. The Flow-X flow computer meets the requirements of even the most demanding applications and is the ideal partner for custody transfer gas measurements using the FLOWSIC600-XT ultrasonic gas flowmeter.

### At a glance

- MID-approved configuration for gas measuring streams with FLOWSIC600-XT
- Powerful modules for demanding applications
- Each module features CPU, memory, and standardized inputs/outputs
- Appealing 7" graphics display with touch operation
- Intuitive user interface for graphics display and in web browser
- True remote access via Ethernet
- Station computer for multiple measuring streams

### Your benefits

- Reduced planning and installation costs thanks to standard configurations
- Very exact flow conversion due to several calculation cycles per second
- High reliability thanks to independent modules with their own volume conversion and storage of measured values, counter readings, and events
- Systems are easy to extend thanks to modules with standardized inputs/outputs that are fully configurable via software
- Very simple operation thanks to intuitive user interface
- Reduced service and maintenance costs with tamper-proof remote maintenance
- Cost-efficient and flexible system integration of multiple measuring distances

### Fields of application

- Custody transfer gas measurement with FLOWSIC600-XT gas flowmeters
- Demanding natural gas and process gas applications
- Standard values for gas volume, mass, and energy
- For natural gas, LNG, special gases, and steam
- Gas measurement with advanced diagnostics with FLOWSIC600-XT 2plex
- Redundant gas measurement with FLOWSIC600-XT Quatro

CE  MID

### More Information online

For more information, enter the link or scan the QR code to get direct access to technical data, operating instructions, software, application examples, and much more.

[www.endress.com/flow-x](http://www.endress.com/flow-x)



# Technical data

The exact device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

## FLOW-X

Ambient temperature	
Flow-X/S	-40 °C ... +75 °C (-40 °F ... +167 °F)
Flow-X/C, Flow-X/P, Flow-X/R	0 °C ... +60 °C (32 °F ... +140 °F)
Storage temperature	
Flow-X/S	-40 °C ... +85 °C (-40 °F ... +185 °F)
Flow-X/C, Flow-X/P, Flow-X/R	-20 °C ... +70 °C (-4 °F ... +158 °F)
Ambient humidity	5% ... 90%; relative humidity; non-condensing
Sunlight	Store and operate out of direct sunlight
Electrical connection	
Voltage	24 V DC, ± 10%, with redundant connections
Current consumption	Flow-X/P0, X/M, X/S: ≤ 0.4 A nominal; ≤ 0.8 A maximal Flow-X/C: ≤ 0.6 A nominal; ≤ 1.0 A maximal
Conformities	
EU directives	2014/32/EU Measuring Instruments Directive (MID) 2014/30/EU Electromagnetic Compatibility Directive 2012/19/EU WEEE Directive (WEEE 2) 2011/65/EU RoHS
Hazardous area	Applies for FlowX/M and X/S only Class I, Division 2, Groups A, B, C, and D, T4 Class I, Zone 2, Group IIC, T4 IECEX Ex ec IIC Gc ATEX II 3 G Ex ec IIC Gc
Electrotechnical & Metrology standards	EN12405-1, A2 IEC 60068-2-1 IEC 60068-2-2 IEC 60068-2-3 IEC 60068-2-31 IEC 60068-2-36 IEC 60654-2 IEC 61000-4-2 IEC 61000-4-3 IEC 61000-4-4 IEC 61000-4-5 IEC 61000-4-6 IEC 61000-4-8 IEC 61000-4-17 IEC 61000-4-29 IEC 61000-6-2 IEC 61000-6-4 IEC 63000 OIML R117-1 WELMEC 7.2, 8.3, 8.8 API 21.1

System	
CPU and memory	800 MHz, 512 MB RAM, 1 GB flash memory
Clock	Real-time clock, accuracy better than 1 sec/day Gold cap for date and time retention
Watchdog	Hardware and software watchdog timer
Multistream capability	Support up to 4 gas runs or 2 liquid runs per module (Flow-X/M, Flow-X/C)
Tamper switch	Mechanical tamper switch to prevent changing of the application and vital parameters within that application
Dimensions	See dimensional drawings
Weight	
Flow-X/P1	3.7 kg (8.2 lbs)
Flow-X/P2	4.5 kg (9.9 lbs)
Flow-X/P3	5.3 kg (11.7 lbs)
Flow-X/P4	6.1 kg (13.4 lbs)
Flow-X/S	2.5 kg (5.5 lbs)
Flow-X/C	2.7 kg (6.0 lbs)
Supported gas chromatographs	Supports all common gas chromatographs (including ABB NGC8200 series, ABB BTU8100, Danalyser, Yamatake HGC, Encal 3000, Angus GOA, Siemens Maxum and Sitrans)

#### I/O per Flow-X/M module or Flow-X/C

Analog inputs*	6x analog transmitter input, high accuracy Input types are 4 to 20 mA, 0 to 20 mA, 0 to 5 V, 1 to 5 V Accuracy mA inputs; 0.002% FS at 21 °C (69.8 °F), 0.008% at full ambient range of 0 ... 60 °C (32 °F ... 140 °F), long-term stability 0.01% per year Resolution 24 bits. Analog inputs share same ground floating in relation to all other electronics.
4-wire PRT inputs	2x resolution 0.02 °C (0.04 °F) for 100 ohms input. Error depending on range 0 ... 50 °C (32 °F ... 122 °F): Error <0.05 °C (0.09 °F) or better; -220 to +220 °C (-396 °F ... +428 °F): Error <0.5 °C (<0.9 °F.) or better
HART*	4x Independent HART loop inputs, on top of 4 to 20 mA signals Support includes multi-drop for each transmitter loop, as well as support for redundant FC operation
Analog outputs	4x Analog output for process outputs and flow / pressure control. Resolution 14 bits, 0.075% FS. Analog outputs share same ground floating in relation to all other electronics.
Pulse Inputs**	4x Single or dual pulse input. Adjustable trigger level at various voltages. Frequency range up to 10 kHz for single and dual pulse. Compliant with ISO6551, IP252, and API 5.5. True Level A and level B implementation.
Density/viscosity**	4x Periodic time input, 100µs to 5000µs. Resolution < 1ns
Digital inputs**	16x Digital status inputs. Resolution 100ns (10MHz)
Digital outputs**	16x Digital output, open collector. Rating 100mA @24V
Pulse outputs**	4x Open collector, 0.01 to 500 Hz
Sphere detector inputs**	4x Supports 1, 2 and 4 detector configurations mode. Resolution 100ns (10MHz)
Prover bus outputs**	1x Meter pulse output for remote proving flow computers. Resolution 100ns (1MHz)

Frequency outputs**	4x Frequency outputs for emulation of flowmeter signals. Maximum frequency 10KHz, accuracy 0.1%
Serial	2x RS485 / RS232 serial port for ultrasonic meter, printer or generic, 115kb Flow-X/P: 4x RS485 / RS232 and 1x RS232 Flow-X/C: 2x RS485 / RS232 and 1x RS485 optional 2x RS485 / RS232 and 2x RS485"
Ethernet	2x RJ45 Ethernet interface, TCP/IP

\* There are 6 analog inputs per module. Analog inputs 1 through 4 support HART

\*\* Total number of pulse inputs + digital inputs + digital outputs + pulse outputs + density inputs + sphere detector inputs + prover bus outputs + frequency outputs = 16

### Volume Correction

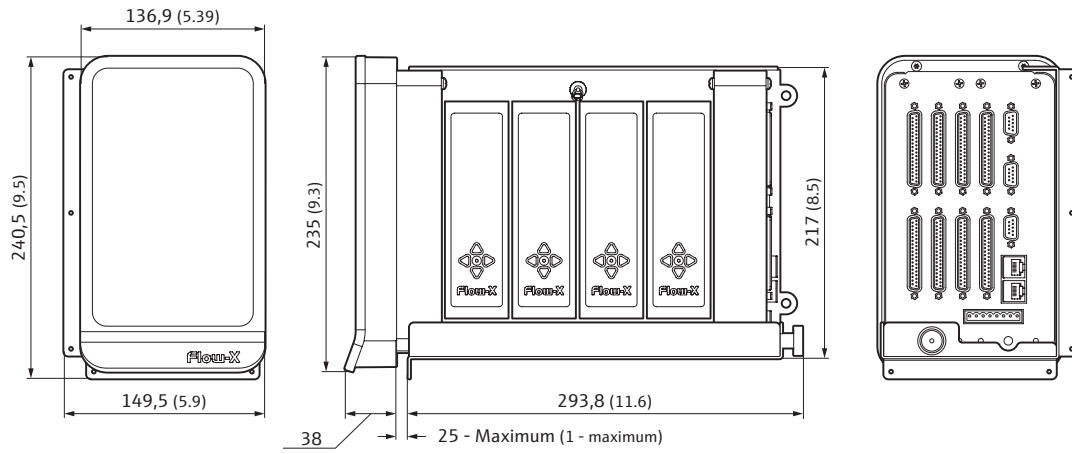
Correction method	PTZ
Gas property calculations	AGA 5, AGA 8 Part 1, AGA 8 Part 2 (GERG-2008), AGA 10 AGA NX-19 GERG-2008 GERG91mod (GOST 30319.2-1996) GOST 30319.2-2015 GSSSD MR-113 ISO 6976, ISO 12213 Parts 2 and 3 S-GERG
Flow rate calculations	AGA 3, AGA 7, AGA 9, AGA 11

## Ordering information

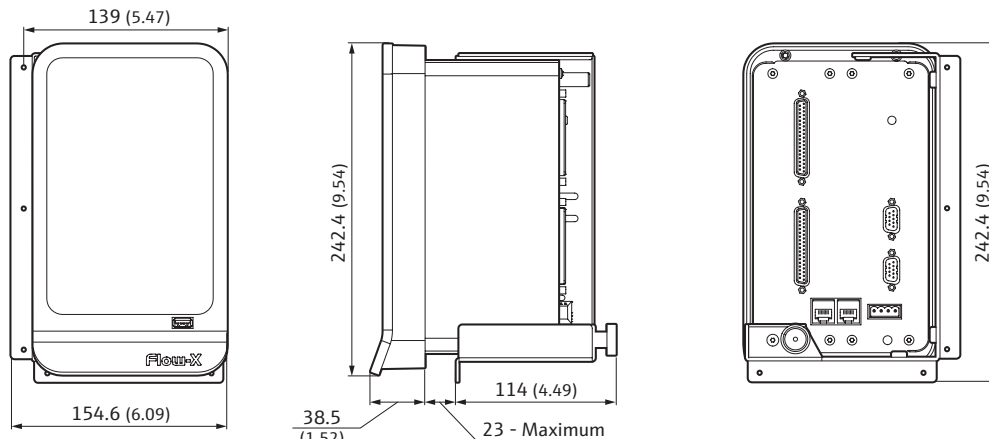
Our regional sales organization will help you to select the optimum device configuration.

# Dimensional drawings

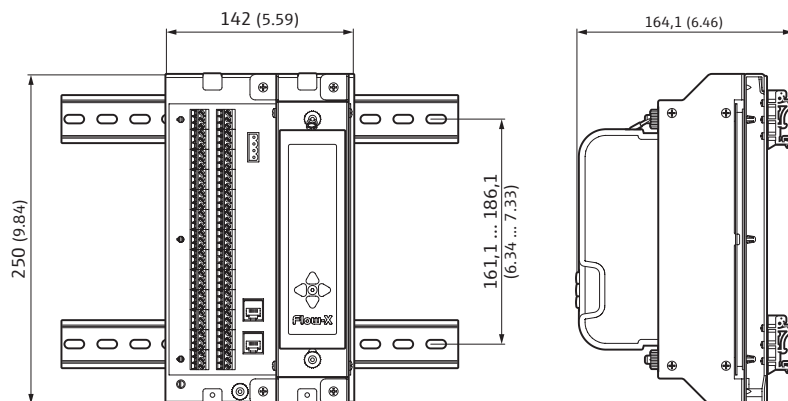
## Flow-X/P (dimensions in mm (inch))



## Flow-X/C (dimensions in mm (inch))



## Flow-X/S (dimensions in mm (inch))











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