General Specifications

FSA120
Flow Configuration Software

FieldMate FlowNavigator™ R1.05

GS 01C25R51-01E

1. Features

The FSA120 (FieldMate FlowNavigator) is the software package which offers various functions to help users to easily configure the mass flow parameters of device.
The FSA120 includes following two programs:
- EJXMVTool: for EJX Multivariable Transmitter
- DYFMVTool: for digitalYEWFLO Vortex Flowmeter

FSA120 includes FieldMate, Yokogawa's frame application. It employs FDT/DTM technology and works on the FieldMate.

FSA120 has the following features:
- Easy flow parameter configuration by dialog windows
- Configuration of the fluid physical properties*
  *: DIPPR, Steam tables IAPWS-IF97, Natural gas standard AGA8/ISO12213
- Configuration of the primary device**
  **: Orifice, Nozzle, Venturi, FIX
- Various flow calculation modes
  EJXMVTool: Auto Compensation Mode / Basic Mode
  DYFMVTool: Detail Compensation Mode / Steam Mode / Simple Mode
- HART and FOUNDATION fieldbus H1 are supported.

FSA120 provides following advantages to device:
- Highly-responsive flow measurement and saving cost by built-in flow computer inside device
- Highly-accurate mass flow rate output compensated by process temperature or pressure value by using the fluid physical properties database
- Easy mass flow configuration by FDT/DTM standard conforming software

FieldMate: Yokogawa's frame application which conforms to FDT standard
FDT (Field Device Tool): defines the system environment in which the DTM runs.
DTM (Device Type Manager): the application which defines the graphical user interface (GUI) specific to the device.
Remarks:
For FSA120 R1.04 or later, the product name has been changed to "FieldMate FlowNavigator" from "EJXMVTool".

2. Functional Details

FieldMate Basic is bundled, which supports the online device parameter configuration while it is connected to the device. If the offline parameter configuration is required, specify FieldMate Advance (option code: /Y).

Device Management

Online parameter
The general parameters of the device can be edited directly in online status.

Offline parameter
The general parameters of the device can be edited and stored in offline database.

Note for FOUNDATION fieldbus
- The function blocks supported by Device Management are as follows;
  EJX Multivariable Transmitter:
  Resource block, Sensor Transducer block, Flow Transducer block, LCD Transducer block, and AI function blocks
  digitalYEWFLO Vortex Flowmeter:
  Resource block, Transducer block, AI function blocks and AR function block

Download/upload
Downloading the flow and general parameters to the device. Uploading the data from the device to PC.

Flow Configuration Wizard
In this mode, the procedures which are required for flow configuration can be performed interactively.

(1) Auto Compensation Mode (EJXMVTool), Detail (Gas / Liquid) Compensation Mode (DYFMVTool)
Procedures to configure flow calculation by setting up a primary device and fluid physical properties in a step-by-step in dialog window.

(2) Basic Mode (EJXMVTool) , Simple (Gas / Liquid) Compensation (DYFMVTool), Steam Compensation Mode (DYFMVTool)
Flow operation and density compensation are performed as follows.
- With the flow factors being input manually (Basic Mode/ Simple (Gas / Liquid) Compensation Mode)
- With the flow factors inside digitalYEWFLO Vortex Flowmeter (Steam Compensation Mode)

(3) Import/export file
Import and export the user flow parameters.

(4) Report
The list of user flow parameters is exported in CSV file format.

Obtain Flow coefficient (for EJXMVTool)
The flow coefficient can be obtained from the device.
Input selection: sensor data actually measured or simulated data input by user.

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Specification of Auto Compensation Mode (EJXMVTool) and Detail Compensation Mode (DYFMVTool)

Supported primary device (for EJXMVTool)
The 19 devices or Fixed Mode as specified in Table 1.
Fixed Mode:
Set a fixed value to Discharge coefficient and Gas expansion factor.

Density compensation
Following (1) and (2) methods are supported for density compensation. For unsupported fluid, data entries to configure custom physical properties are also available as shown in (3).

(1) Density compensated by physical properties

Database:
As specified in Table 2

Source:
American Institute of Chemical Engineers (AIChE®) DIPPR® Project No.801 Database: 2003 Edition

(2) Density compensated using standard

Natural gas:
AGA8
Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases.
American Gas Association (AGA)
Transmission Measurement Committee Report No.8 Second Edition, November 1992
Detail Characterization Method
Gross Characterization Method 1
Gross Characterization Method 2
ISO 12213:1997 First edition 1997-12-01
Part 2: molar-composition analysis
Part 3: physical properties

Steam tables (for EJXMVTool):
IAPWS-IF97 Water and Steam (1997)
IAPWS-IF97: IAPWS Industrial Formulation 1997
IAPWS: The International Association for the Properties of Water and Steam.

(3) Custom fluid density and viscosity compensation:
Numerical value can be input to configure physical properties (density, viscosity, etc.)

3. System Requirements

The quality and operability of the FlowNavigator are certified for use with FieldMate only. The operational condition depends on frame application. The followings describe the operating conditions of FieldMate.

<Hardware Operating Environment>

- **PC**
  - Machine: IBM PC/AT compatible

	Windows 7	Windows Vista
CPU	Intel® Core™2 Duo T7100 or similar specification CPU	
Main Memory	2GB or more	1GB or more (2GB or more recommended)
Hard Disk Drive	8GB or more	
DVD-ROM Drive	Windows 7 compatible	Windows Vista compatible
Display	1024×768 or better resolution recommended Windows 7 compatible	1024×768 or better resolution recommended Windows Vista compatible

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- **Network port**
  For HART device:
  One USB port USB 2.0 standard / Bluetooth 2.0
  For FOUNDATION fieldbus H1 device:
  PCMCIA card slot / One USB port USB2.0 standard

<Software Operating Environment>

Common requirement:
- Windows
  Windows 7 Professional 32bit/64bit (English)
  Windows Vista business 32bit SP2 or later/
  Home premium 32bit SP2 or later, English
- Adobe Reader
- Frame application: FieldMate R2
- Communication DTM (included in FieldMate)

Requirement for FOUNDATION fieldbus:
- NI-FBUS Communications Manager
  Windows Vista, Windows 7: 4.0.1 or later
- Function Block Scheduling and Connection Tool (For DYFMVTool)
  e.g.NI-FBUS Configurator
  Windows Vista, Windows 7: 4.0.1 or later

4. Model and Suffix Codes

R1.05

Model	Suffix Codes	Descriptions
FSA120	· · · · · · · · · · ·	Flow Configuration Software***
License	**-S** · · · · · · · · ·	Single PC License*
———	**1** · · · · · · · · ·	Always 1
———	**1** · · · · · · ·	Always 1
———	**0**· · · · · · ·	Always 0
Optional code	**/Y**· · · · ·	FieldMate Advance License**

*: Single user on a single PC
**: If the parameter configuration while it is not connected to the device is required, specify this option code.
***: For FSA120 R1.03 or before, "EJX-MV configuration DTM" was used.

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Models to be connected

- EJX Multivariable Transmitter
  EJX910A/EJX930A
  Protocol: HART, FOUNDATION fieldbus
- digitalYEWFLO Vortex Flowmeter
  DY-F/DYA-F
  Protocol: FOUNDATION fieldbus
  Device Type: 9, Device revision: 3 or later

Recommended Communications interface

HART:

Yokogawa USB HART Modem
(Parts number: F9197UB)
Yokogawa USB FieldMate modem
(Parts number: F9197UC)
VIATOR ® Bluetooth ® Interface
(Model 010041 (MACTek ®)) *

FOUNDATION fieldbus:

National Instruments
PCMCIA-FBUS
• Windows Vista, Windows 7: FBUS Series 2
NI USB-8486
FFusb (Softing) **

* : Microsoft supplied Bluetooth stack is used.
**: The package is provided complete with FieldMate driver from Softing.

Components

FSA120 includes the following items:

<FlowNavigator>

- CD-ROM: FlowNavigator
- License number sheet for FlowNavigator
- Getting started and Software License Agreement for FlowNavigator

<FieldMate>

- CD-ROM: FieldMate
- DVD-ROM: Device Files
- Licence number sheet for FieldMate
  For the details, refer to GS 01R01A01-01E.
- Getting started and Operational Precaution for FieldMate

*: Compatibility
Compatibility between FieldMate and Device Files is indicated at the following URL.
https://voc.yokogawa.co.jp/PMK/

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<RELATED INSTRUMENTS AND SOFTWARE>

EJX910A Multivariable Transmitter:
GS 01C25R01-01E
EJX930A Multivariable Transmitter:
GS 01C25R04-01E
Model DY Vortex Flowmeter, Model DYA Vortex Flow Converter:
GS 01F06A00-01E
Model DY, Model DYA FOUNDATION Fieldbus Communication Type Vortex Flowmeter:
GS 01F06F01-01E
FieldMate:
GS 01R01A01-01E

Table 1. Supported primary Devices

Type	Primary Device
FIX	Fixed Mode (Sets the discharge coefficient and gas expansion factor to a fixed value)
Orifice	Orifice Corner Taps [ISO5167-1 1991]
	Orifice Corner Taps [ISO5167-2 2003]
	Orifice Corner Taps [ASME MFC-3M 1989]
	Orifice Flange Taps [ISO5167-1 1991]
	Orifice Flange Taps [ISO5167-2 2003]
	Orifice Flange Taps [ASME MFC-3M 1989]
	Orifice Flange Taps [AGA No.3 1992]
	Orifice D and D/2 Taps [ISO5167-1 1991]
	Orifice D and D/2 Taps [ISO5167-2 2003]
	Orifice D and D/2 Taps [ASME MFC-3M 1989]
Nozzle	ISA1932 nozzle [ISO5167-1 1991/ ISO5167-3 2003]
	Long radius nozzle [ISO5167-1 1991/ ISO5167-3 2003]
	ASME FLOW NOZZLES [ASME MFC-3M 1989]
Venturi	Venturi nozzle [ISO5167-1 1991/ ISO5167-3 2003]
	Classical Venturi tube “as cast” convergent section [ISO5167-1 1991/ ISO5167-4 2003]
	ASME Venturi Tubes With a rough Cast or Fabricated Convergent [ASME MFC-3M 1989]
	Classical Venturi tube with a machined convergent section [ISO5167-1 1991/ ISO5167-4 2003]
	ASME Venturi Tubes With a machined convergent section [ASME MFC-3M 1989]
	Classical Venturi tube with a rough-welded sheet-iron convergent section [ISO5167-1 1991/ ISO5167-4 2003]

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Table 2. Supported physical Properties database

Fluid name	Fluid name	Fluid name
Acetic Acid (*)	Hydrogen Chloride	Phosphoric Acid (*)
Acetone	Hydrogen Cyanide	Propadiene
Acetonitrile	Hydrogen Peroxide	Propane
Acetylene	Hydrogen Sulfide	Propylene
Acrylonitrile	Isobutane	Pyrene
Air	Isobutene	Styrene
Allyl Alcohol	Isobutylbenzene	Sulfur Dioxide
Ammonia	Isopentane	Toluene
Argon	Isoprene	Trichloroethylene
Benzaldehyde	Isopropanol	Trichlorofluoromethane
Benzene	m-chloronitrobenzene	Vinyl Acetate
Benzoic Acid (*)	m-dichlorobenzene	Vinyl Chloride
Benz Alcohol	Methane	Vinyl Cyclohexene
Biphenyl	Methanol	Water
Bromine	Methyl Acrylate	1-Butene
Carbon Dioxide	Methyl Ethyl Ketone	1-Decene
Carbon Monoxide	Methyl Vinyl ether	1-Decanal
Carbon Tetrachloride	Monochlorobenzene	1-Decanol
Chlorine	n-Butane	1-Dodecene
Chlorodifluoromethane	n-Butanol	1-Dodecanol
Chloroprene	n-Butyraldehyde	1-Heptanol
Chlorotrifluoroethylene	n-Butyronitrile	1-Heptene
Cycloheptane	n-Decane	1-Hexene
Cyclohexane	n-Dodecane	1-Hexadecanol
Cyclopentane	n-Heptadecane	1-Octanol
Cyclopentene	n-Heptane	1-Octene
Cyclopropane	n-Hexane	1-Nonanal
Dichlorodifluoromethane	n-nonane	1-Nonanol
Divinyl Ether	n-Octane	1-Pentadecanol
Ethane	n-Pentane	1-Pentanol
Ethanol	Neon	1-Pentene
Ethylamine	Neopentane	1-Undecanol
Ethylbenzene	Nitric Acid (*)	1,1,2,2-Tetrafluoroethane
Ethylene	Nitric Oxide	1,1,2-Trichloroethane
Ethylene Glycol	Nitrobenzene	1,2,4-Trichlorobenzene
Ethylene Oxide	Nitroethane	1,2-Butadiene
Fluorene	Nitrogen	1,3-Butadiene
Furan	Nitromethane	1,3,5-Trichlorobenzene
Helium-4	Nitrous Oxide	1,4-Dioxane
Hydrazine	Oxygen	1,4-Hexadiene
Hydrogen	Pentafluoroethane	2-Methyl-1-Pentene
	Phenol	2,2-Dimethylbutane

*: Only for liquid.

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