

# General Specifications

## FSA120 Flow Configuration Software

**FieldMate**  
**FlowNavigator™** R1.05

GS 01C25R51-01EN

### 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 digitalYEWFO 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 Compensation Mode / Simple Compensation 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
  - digitalYEWFO 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 Mode (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 digitalYEWFO 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.

## 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

### • 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 /Home

Premium 32bit/64bit SP1 or later (English)

Windows Vista business 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
<b>FSA120</b>	.....	Flow Configuration Software***
License	<b>-S</b> .....	Single PC License*
—	<b>1</b> .....	Always 1
—	<b>1</b> .....	Always 1
—	<b>0</b> .....	Always 0
Optional code	<b>/Y</b> ....	FieldMate Advance License**
	<b>/B</b> ....	USB FieldMate Modem attached

\*: 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.

**Models to be connected**

- EJX Multivariable Transmitter  
EJX910A/EJX930A  
Protocol: HART, FOUNDATION fieldbus
- digitalYEWFO 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:**

Softing  
FFusb \*\*  
National Instruments  
PCMCIA-FBUS Series 2  
NI USB-8486

\*: 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

**<Modem> (Option)**

- USB FieldMate modem: BRAIN/HART, with cables  
For the details, refer to GS 01R01A01-01E.

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

**Table 1. Supported primary Devices**

Type	Primary Device
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]
FIX	Classical Venturi tube with a rough-welded sheet-iron convergent section [ISO5167-1 1991/ ISO5167-4 2003]
	Fixed Mode (Sets the discharge coefficient and gas expansion factor to a fixed value)

Table 2. Supported physical Properties database

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

\*: Only for liquid.