

# ORDERING INFORMATION

# MODEL : M6xXF1

PLEASE FILL IN THIS SECTION



Model
Company
Name
P/O No.

M-SYSTEM USE ONLY



Job No.	Approved by (Sales office)
Ser No.	Issued by (Sales office)
Sales	Approved by (Factory)
	Set by (Factory)
	Ser No.

Specify the items you want to change. Default setting will be used if not specified.

DEFAULT shows values in case of nothing specified.

## SETTING

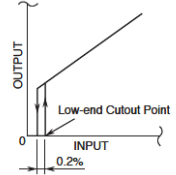
PARAMETER		AVAILABLE VALUE/AVAILABLE ITEM	DEFAULT VALUE	SET VALUE	FACTORY INTERNAL CHECK
Input	Low-end cutout *1	0.0000 ~ 99.9999 %	0.000 % (Low-end cutout function is cancelled.)	%	<input type="checkbox"/> Checked
Filter type *2		<ul style="list-style-type: none"> <li>•Disable</li> <li>•Moving average</li> <li>•Dead-time computing</li> <li>•Delay buffer</li> <li>•Lead-time computing</li> <li>•Ramp buffer</li> </ul>	Moving average	<input type="checkbox"/> Disable <input type="checkbox"/> Moving average <input type="checkbox"/> Dead-time computing <input type="checkbox"/> Delay buffer <input type="checkbox"/> Lead-time computing <input type="checkbox"/> Ramp buffer	<input type="checkbox"/> Checked
T:Filter time constant *3		0.0000 (No filter) 0.5000 ~ 100.0000 sec.	0.0000 (No filter)	sec.	<input type="checkbox"/> Checked
H:Sampling cycle		0.1000 ~ 100.0000 sec.	0.1000 sec.	sec.	<input type="checkbox"/> Checked
N:Filter samples		1 ~ 128	1		<input type="checkbox"/> Checked
U:Low-cut samples		$((\text{High-cut samples}) + (\text{Low-cut samples}) + 1) \leq 128$	0		<input type="checkbox"/> Checked
L:High-cut samples		$((\text{High-cut samples}) + (\text{Low-cut samples}) + 1) \leq 128$	0		<input type="checkbox"/> Checked
CP:Max. positive rate		0.0000 ~ 200.0000 %/sec.		%/sec.	<input type="checkbox"/> Checked
CN:Max. negative rate		0.0000 ~ 200.0000 %/sec.		%/sec.	<input type="checkbox"/> Checked
Linearization *4		0:Disable 1:Enable •User's table linearization •Inverted output •Square root extraction (orifice, venturi) •X <sup>2</sup> Output (Palmer-bowlus flume, Parshall fulme) •X <sup>5/2</sup> Output (triangular V-notch weir) •X <sup>3/2</sup> Output (rectangular weir)	0:Disable Linearization	<input type="checkbox"/> 0:Disable <input type="checkbox"/> 1:Enable <input type="checkbox"/> User's table linearization (Use the LINEARIZATION table.) <input type="checkbox"/> Inverted output <input type="checkbox"/> Square root extraction (orifice, venturi) <input type="checkbox"/> X <sup>2</sup> Output (Palmer-bowlus flume, Parshall fulme) <input type="checkbox"/> X <sup>5/2</sup> Output (triangular V-notch weir) <input type="checkbox"/> X <sup>3/2</sup> Output (rectangular weir)	<input type="checkbox"/> Checked

PARAMETER		AVAILABLE VALUE/AVAILABLE ITEM	DEFAULT VALUE	SET VALUE	FACTORY INTERNAL CHECK
Output	Input low limit *5	-2.0000 ~ 10.0000 %	-2.0000 %	%	<input type="checkbox"/> Checked
	Input high limit *5	90.0000 ~ 102.0000 %	102.0000 %	%	<input type="checkbox"/> Checked

\*1. Low-end cutout

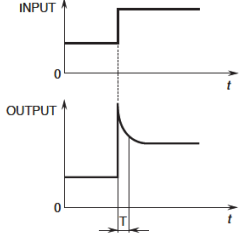
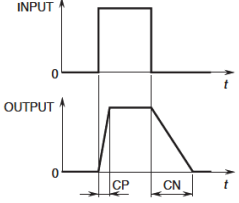
The input signals below the low end cutout point are handled as 0%.

The point has 0.2% hysteresis (deadband). The low-end cutout is applied exactly at the point when an increasing signal passes through the point, while it is applied at -0.2% of the point when a decreasing signal passes through it. Set between 0.0000% and 99.9999%. With 0.0000% setting, the low-end cutout function is cancelled.



\*2. Filter type

Disable	No Filter function is used.											
Moving average	<p>The module samples input signals every H seconds and, excluding U numbers of highest-value samples and L numbers of lowest-value samples, outputs proportionally to the average of the rest [N × (U + L)] of sampled data. When a new input is sampled after another H seconds, it gives up the oldest sample and calculates a new average including the latest sample and outputs proportionally.</p> <p>When the number of samples to be calculated equals 0 or less, it outputs an error.</p>											
	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Selection or Programmable Range</th> </tr> </thead> <tbody> <tr> <td>Sampling cycle H</td> <td>0.1000 to 100.0000 seconds</td> </tr> <tr> <td>Filter samples N</td> <td>1 to 128</td> </tr> <tr> <td>High-cut samples U</td> <td>([High-cut samples] + [Low-cut samples] + 1) ≤ 128</td> </tr> <tr> <td>Low-cut samples L</td> <td>([High-cut samples] + [Low-cut samples] + 1) ≤ 128</td> </tr> </tbody> </table>	Parameter	Selection or Programmable Range	Sampling cycle H	0.1000 to 100.0000 seconds	Filter samples N	1 to 128	High-cut samples U	([High-cut samples] + [Low-cut samples] + 1) ≤ 128	Low-cut samples L	([High-cut samples] + [Low-cut samples] + 1) ≤ 128	
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Dead-time computing	<p>The module does not respond to an input signal for a preset dead-time* duration. In addition, with adjusting a time constant T, it generates a first order lag output after the dead-time. Set 0.0000 for the time constant when the first order lag is not needed.</p> $X_0(s) = \frac{e^{-Hs}}{1 + Ts} X_1(s)$ <p>where <math>X_1</math> : Input <math>X_0</math> : Output</p> <p>Dead time = H × N (s)</p>	<p>• Step input with dead-time</p> <p>• Step input with dead-time plus time constant</p>										
Delay buffer	<p>The module generates a first order lag output.</p> $X_0(s) = \frac{1}{1 + Ts} X_1(s)$ <p>where <math>X_1</math> : Input <math>X_0</math> : Output</p>	<p>• Step input with time constant</p>										
	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Selection or Programmable Range</th> </tr> </thead> <tbody> <tr> <td>Filter time constant T</td> <td>0.5000 to 100.0000 seconds</td> </tr> </tbody> </table> <p>*Output is refreshed every sampling cycle. The response time may be delayed by 1 cycle at the maximum.</p>	Parameter	Selection or Programmable Range	Filter time constant T	0.5000 to 100.0000 seconds							
Parameter	Selection or Programmable Range											
Filter time constant T	0.5000 to 100.0000 seconds											

Lead-time computing	<p>The module operates a lead-time equation.</p> $X_0(s) = (1 + Ts) X_1(s)$ <p>where <math>X_1</math> : Input <math>X_0</math> : Output</p> <table border="1" data-bbox="379 230 817 302"> <thead> <tr> <th>Parameter</th> <th>Selection or Programmable Range</th> </tr> </thead> <tbody> <tr> <td>Filter time constant T</td> <td>0.5000 to 100.0000 seconds</td> </tr> </tbody> </table>	Parameter	Selection or Programmable Range	Filter time constant T	0.5000 to 100.0000 seconds	<p>• Step input with lead-time constant</p> 		
Parameter	Selection or Programmable Range							
Filter time constant T	0.5000 to 100.0000 seconds							
Ramp buffer	<p>The module's output does not change faster than a preset maximum rate, positive CP and negative CN, no matter how fast its input changes.</p> <p>Setting 0.0000 cancels the filter.</p> <table border="1" data-bbox="379 548 817 645"> <thead> <tr> <th>Parameter</th> <th>Selection or Programmable Range</th> </tr> </thead> <tbody> <tr> <td>Max. positive rate CP</td> <td>0.0000 to 200.0000 %/second</td> </tr> <tr> <td>Max. negative rate CN</td> <td>0.0000 to 200.0000 %/second</td> </tr> </tbody> </table>	Parameter	Selection or Programmable Range	Max. positive rate CP	0.0000 to 200.0000 %/second	Max. negative rate CN	0.0000 to 200.0000 %/second	<p>• Step input with rate-of-change limits</p> 
Parameter	Selection or Programmable Range							
Max. positive rate CP	0.0000 to 200.0000 %/second							
Max. negative rate CN	0.0000 to 200.0000 %/second							

**\*3. Filter time constant**

First order lag filter used other than for the M6xXF1. Time constant, time required for a step input to track and reach approx. 63% of the full-scale, is selectable from 0.5 to 30 seconds. No filter is applied when set to 0. For the M6xXF1, this parameter is used with specific filter functions. Refer to respective filter types for more information.

\*4. Sampling cycle, Filter Samples, Low-cut samples, High-cut samples, Max. positive rate, Max. negative rate are parameters specifically used with the M6xXF1 filter functions.

**\*5. Linearization**

Choose among the following:

- 0:Disable
- 1:Enable

With '0:Disable' selected, the output % is proportional to the input %.

With '1:Enable' selected, the input % is converted into the output % according a user specified table.

When you choose 1:Enable, use the LINEARIZATION table. For more information, refer to Section Linearization.

**\*6. Output high limit, Output low limit**

The output signal is limited within the range between the high limit and the low limit.

For example, when the high limit is set to 90% and the low limit to 10%, the input signal between 90% and 102% is converted as 90%, while the input between -2% and 10% is converted as 10%.

**Linearization**

Choose among the following:

**User's Table Linearization**

The input is converted into a linearized output according to the user specified segment data table, defined with pairs of X (input) and Y (output) values.

2 to 101 segment points can be specified.

**Inverted Output**

The output is inversely proportional to the input.

$$X_0 = 100 - X_1$$

where  $X_1$  : Input  
 $X_0$  : Output

**Square Root Extraction (orifice, venturi)**

The output is inversely proportional to the input.

$$X_0 = 10 \sqrt{X_1}$$

where  $X_1$  : Input  
 $X_0$  : Output

**X<sup>2</sup> Output (Palmer-Bowlus flume, Parshall flume)**

$$X_0 = X_1^2 / 100$$

where  $X_1$  : Input  
 $X_0$  : Output

**X<sup>5/2</sup> Output (triangular or V-notch weir)**

$$X_0 = X_1^{5/2} / 1000$$

where  $X_1$  : Input  
 $X_0$  : Output

**X<sup>3/2</sup> Output (rectangular weir)**

$$X_0 = X_1^{3/2} / 10$$

where  $X_1$  : Input  
 $X_0$  : Output

■ LINEARIZATION

Specify the input & output values and the units.

X[n] = Input Value of n-th (mA, V, %)

Y[n] = Output Value of n-th (mA, V, %)

-2% ≤ X[n] ≤ 102%, -2% ≤ Y[n] ≤ 102%, X[n] < X[n+1]

<b>Factory Internal check</b>
<input type="checkbox"/> Checked

n	X (UNIT: )	Y (UNIT: )	n	X	Y
0			25		
1			26		
2			27		
3			28		
4			29		
5			30		
6			31		
7			32		
8			33		
9			34		
10			35		
11			36		
12			37		
13			38		
14			39		
15			40		
16			41		
17			42		
18			43		
19			44		
20			45		
21			46		
22			47		
23			48		
24			49		

n	X	Y	n	X	Y
50			75		
51			76		
52			77		
53			78		
54			79		
55			80		
56			81		
57			82		
58			83		
59			84		
60			85		
61			86		
62			87		
63			88		
64			89		
65			90		
66			91		
67			92		
68			93		
69			94		
70			95		
71			96		
72			97		
73			98		
74			99		
			100		