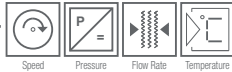


INSTRUCTION MANUAL IM 109 E

Device: FMP 1836 - with LCD display
measurement computer for limit value monitoring of
frequency input

Content: Instruction manual

Rev.-No.: IM 109 E V0.1-2017-06-26; FW 4.12



User information

- Prior to installing the equipment or before attempting initial start-up, please read this manual thoroughly.
- Please ensure to observe all information and warnings provided in this manual.
- The serial number of the equipment can be found on the identification plate. You will need this information when ordering spare parts. The plate is attached to the outside of the device.
- Installation, start-up and maintenance may only be performed by an electrician. The local guidelines of the place of installation have to be observed.
- Maintenance may only be performed under dead-voltage conditions for personal security reasons.
- In order of guarantee operational safety, only the manufacturer's original spare parts shall be installed.
- Operating the equipment for purposes other than its intended use shall void all warranty claims and product liability. Noncompliance with the intended use refers to but is not limited to improper installation, start-up, operation, maintenance and neglecting the information provided in this manual.
- The device must be integrated into the lightning protection concept of the plant.



Please ensure to operate this device only in accordance with this manual. Departure from these instructions will void and nullify all warranty claims and jeopardizes the operating safety of the device.

We reserve the right to engineering changes, which may necessitate deviations from the current data provided in this manual. Should you require additional information or questions arise that are not sufficiently covered in this manual, please contact us at the following address:

Imprint

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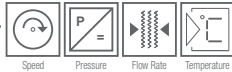
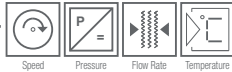


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1 Introduction

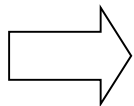
1.1 Operating instructions, general information

These operating instructions are intended for the use of the device and meant to provide support during the installation, operation, and maintenance.

The structure of the document shall make this easy. Important text is highlighted.

Symbols

The following symbols are used in these operating instructions in order to highlight text that requires special attention.



Notes

This arrow points to features that require your special attention.



Caution

This symbol points to important text.

Noncompliance or disregard may cause damage to components or destruction to parts of the system.



Warning!

This symbol points to important text. Noncompliance will place the life and health of persons at risk.

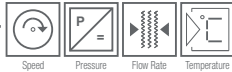


Reference

This symbol refers to additional information available in other manuals, chapters, or sections.

1.2 Goods receipt inspection, transportation, storage

- Ensure the packaging is not damaged!
- Any damaged packaging must be reported to the supplier.
- Retain any damaged packaging until the matter has been resolved.
- Ensure the package's content is not damaged!
- Any damaged part received must be reported to the supplier.
- Retain any damaged goods until the matter has been resolved.
- Use the delivery documents to check the received goods and compare the goods with your order to ensure completeness. For storage and transport purposes, the equipment must be packed with care to prevent damage caused by impact or humidity. Only the original packaging can ensure optimal protection. Furthermore, compliance with all allowable ambient conditions is mandatory (section 4).
- If you have any questions, please contact your supplier or the respective distribution centre.



2 Warranty

The devices were built in compliance with current directives and have left the factory in technically flawless condition.

In the unlikely event that you still may have reasons for a complaint and the fault can be traced to a factory error, we shall correct any defects at no additional charge. However, in such case, it is your responsibility to report the damage immediately after detection and/or within our permitted warranty period.

Damage caused due to improper use or as a result of noncompliance with these operating instructions, is excluded from this warranty.

The warranty period is 12 months. Unless otherwise agreed upon, the warranty period for spare parts is 12 months as well. The fulfilment of warranty claims shall not extend the warranty period.

The warranty shall become null and void if the measurement module has been opened, unless otherwise expressly stated in the operating instructions or for maintenance purposes only. This shall also apply if serial numbers have been changed, damaged, or removed.

Any repairs, adjustments or similar tasks necessary besides warranty performances shall be without charge. Other services, including transport and packaging shall be invoiced.

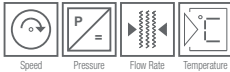
Unless liability is mandatory by law, further claims, in particular claims based on damages that do not concern the delivered components, are excluded.

Services provided after the warranty period

Of course, we will be pleased to assist you once the warranty has expired. You can reach us directly by calling.

Contact:

Phone: +49 (6021) 45 807 - 0
Fax: +49 (6021) 45 807 - 20
eMail: service@esters.de



3 General information

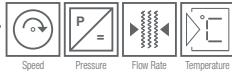
The FMP 1836 is a 2-channel device “A” and “B” for monitoring the limit value of frequency inputs. Two signal converters SC 500 are connected to port 1 and 2. Each channel monitors 3 limit values. The device has implemented 7 relays. The relays are fixed to limitators for limit monitoring. Freely configurable signal sources can be applied to the limitators.

3.1 Benefits at a glance



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Application areas	Benefits at a glance
<ul style="list-style-type: none"> - Actual value for analog speed control - Paper, fiber, film, steel and crane industry - Turbines - Generators - Centrifuges - Emergency diesel - Textile machines - Test stands - Agitators 	<ul style="list-style-type: none"> - Integrated recorder function for logging of measurement values (2 GB ring storage) - Linearisation via a maximum of 12 support points - Up to three limit values / relays / changeovers - 2 digital inputs for start and stop function for control via PLC - Integration in IT networks via Ethernet/IP for remote data transfer - Integration in industry bus systems, e.g. Profibus DP, Modbus RTU, Modbus TCP, Profinet - Up to 12 measuring computers can be networked via an internal CAN bus - Persistent data retention of total counter reading in case of power loss for a period of up to 5 years



4 Installation / servicing / maintenance

This device has been designed for direct mounting on a DIN rail. The monitor can be mounted directly in a switch cabinet or in a separately available housing. Installation may only be performed by specialist, trained personnel.

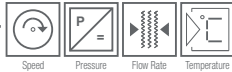
Servicing and maintenance activities may only be performed by **Esters Elektronik GmbH** technicians or by persons trained by Esters Elektronik GmbH.

Contact:

Phone: +49 (6021) 45 807 - 0

Fax: +49 (6021) 45 807 - 20

eMail: service@esters.de



5 Technical specifications

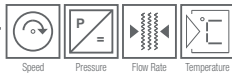
The FMP 1836-8001 is available as 2-channel unit. The device series has been constructed according to the modular principle. The principle allows configuration of inputs and outputs as well as of interfaces and software options according to individual usage and operating system requirements. The section on technical specifications provides an overview in respect of the series.

5.1 Input

INPUT 1 (CHANNEL "A")	frequency „A“: 10 - 1 kHz with 5% duty cycle, impulse length > 500 ms
INPUT 2 (CHANNEL "B")	frequency „B“: 10 - 1 kHz with 5% duty cycle, impulse length > 500 ms

5.2 Relay

K1: LIMIT VALUE „MIN“ CHANNEL „A“	NO contact, 30 V, AC, 1A inductive
K2: LIMIT VALUE „BAND“ CHANNEL „A“	NO contact, 30 V, AC, 1A inductive
K3: LIMIT VALUE „MAX“ CHANNEL „A“	NO contact, 30 V, AC, 1A inductive
K4: LIMIT VALUE „MIN“ CHANNEL „B“	NO contact, 30 V, AC, 1A inductive
K5: LIMIT VALUE „BAND“ CHANNEL „B“	NO contact, 30 V, AC, 1A inductive
K6: LIMIT VALUE „MAX“ CHANNEL „B“	NO contact, 30 V, AC, 1A inductive
K7: LIMIT VALUE „NOTCH“ CHANNEL „A“	NO contact, 30 V, AC, 1A inductive
K8: DEVICE STATUS	NO contact, 30 V, AC, 1A inductive



5.3 Electrical values

ACCURACY	± 0.05% unit value ± 1 digit at 23°C
MAINS SUPPLY (STANDARD)	24 V, DC ± 3V
CURRENT CONSUMPTION	max. 1.25 A
	Fuse protection by means of 3A preliminary fuse or inherently safe mains adaptor
POWER CONSUMPTION	max. 30 VA
EXTERNAL MAINS ADAPTOR	24 V/DC

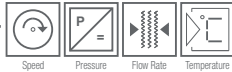
5.4 Environmental influences

AMBIENT TEMPERATURE	-10 to +55°C
STORAGE TEMPERATURE	-20 to +85°C
TEST VOLTAGE	3 kV
HUMIDITY CLASS	E-DIN 40040
ELECTROMAGNETIC COMPATIBILITY	as per DIN EN 61000
CLIMATIC CLASS	as per IEC 60 654-1 Class B2 / EN 1434 Class "C" (no condensation permitted)
ELECTRICAL SAFETY	as per IEC 61010-1: Environment < 2000 m height above NN
OVERVOLTAGE CATEGORY	IEC 61010-1, Protection class II, Overvoltage category II
DEGREE OF CONTAMINATION	Degree of contamination 2

5.5 Mechanical values

TORQUE CLAMPS	0.15 Nm max.
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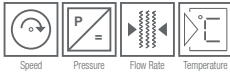


5.6 Display and housing

DISPLAY	6-digit LCD display for flow rate in Nm ³ /h 7-digit LCD display in Nm ³ LCD height 8 mm
STANDARD HOUSING DIN RAIL MOUNTING	Modular clamp housing made from Makrolon Fire classification as per UL 94:V-D 35 mm standard rail as per DIN EN 50022 Dimensions: 100 (W) x 100 (H) x 107 (D) mm Protection class IP 20
FIELD HOUSING (OPTION M104)	Dimensions: 343 (W) x 330 (H) x 210 (D) mm Wall mounting Protection class IP 65
FIELD HOUSING WITH EX-ZONE (OPTION M105)	Dimensions: 385.5 (W) x 487 (H) x 210 (D) mm Wall mounting Protection class IP 65
TOTAL WEIGHT:	
FMP 1836	480 g
INCL. FIELDHOUSING M104	3650 g
INCL. FIELDHOUSING M105	5650 g

5.7 Interfaces

RS 232	9-pin connection to update the firmware
USB	Mini USB-connection (5-pin, USB 2.0) for configuration and data transfer through PC
CAN-BUS (OPTIONAL)	Internal communication of up to 12 curable devices
PROFIBUS DP (OPTIONAL)	Data transmission via Profibus-DP protocol
MODBUS-RTU (OPTIONAL)	Data transmission via MODBUS-RTU protocol
MODBUS-TCP (OPTIONAL)	Data transmission via MODBUS-TCP protocol
ETHERNET (OPTIONAL)	Integration into the IT-network for configuration and data transfer through PC



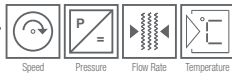
5.8 Software and recorder

E3DM	Configuration software for Microsoft Windows (32-Bit)
RING BUFFER	2 GB ring buffer Integrated recorder function for logging measurement values over a period of several years

6 Device types

FMP-	1836-8001
INPUT:	
1: frequency „A“	•
2: frequency „B“	•
3:	
4:	
5:	
6:	
7:	
8:	
RELAY:	
K1 (NO contact): limit value „MIN“ channel „A“	•
K2 (NO contact): limit value „BAND“ channel „A“	•
K3 (NO contact): limit value „MAX“ channel „A“	•
K4 (NO contact): limit value „MIN“ channel „B“	•
K5 (NO contact): limit value „BAND“ channel „B“	•
K6 (NO contact): limit value „MAX“ channel „B“	•
K7 (NO contact): limit value „NOTCH“ channel „A“	•
K8 (NO contact): device status	•

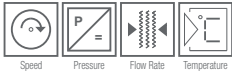
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6.1 Optional device functions and housing

GDR 1836-8001-00	
0	no selection
1	Interface PROFIBUS-DP
2	Interface Modbus-RTU
4	Interface Modbus-TCP
0	no selection
1	Interface CAN-Bus
4	Interface Ethernet TCP/IP
5	Interface CAN-Bus, Interface Ethernet TCP/IP
8	Ring storage 2 GB (data recorder)
9	Ring buffer 2 GB (data recorder), Interface CAN-Bus
C	Ring buffer 2 GB (data recorder), Interface Ethernet TCP/IP
D	Ring buffer 2 GB (data recorder), Interface CAN-Bus, Interface Ethernet TCP/IP
HOUSING	
M104	Field housing for wall mounting, protection class IP 65

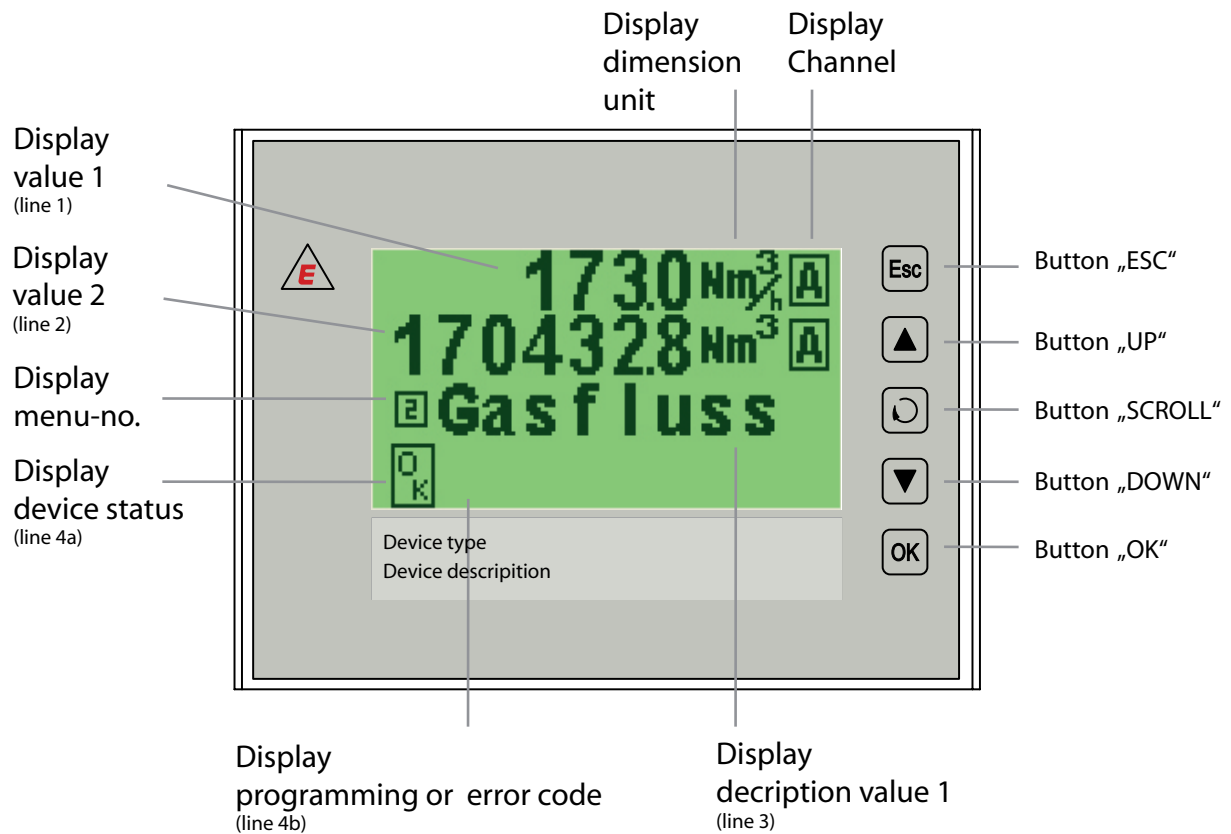
Rev.-Nr.: IM 109 E V0.1-2017-06-26; FW 4.12



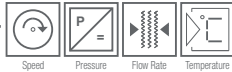
7 Operating panel

7.1 Layout of LCD display

The following figure provides information on the layout of the LCD display of the device.



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






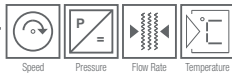
7.2 Measured value display

Four-line LCD display, whereby lines 1 to 3 show a maximum of 10 digits.

Measured value display

SCREEN	CONTENT OF LINE 1 (VALUE 1)	CONTENT OF LINE 2 (VALUE 2)	CONTENT OF LINE 3 (VALUE 3)
1	frequency „A“ [Hz]	rotational speed „A“ [min-1] or [rpm]	channel A
2	frequency „B“ [Hz]	rotational speed „B“ [min-1] or [rpm]	channel B


CONTENT OF LINE 3	Plain text in German, according to content of line 1.		
CONTENT OF LINE 4A	DEVICE STATUS DISPLAY	OK	The device is ready for operation and is running in standard function mode; no errors present.
		M	An application error has occurred, i.e. a function failure was detected.
		E	A system error (hardware defect, powering up error etc.) was detected, i.e. the device can no longer guarantee functionality. Please contact the service department.
CONTENT OF LINE 4B	DISPLAY OF PROGRAMMING CODE	The code display can be found to the right of the status display, and comprises a 9-digit LCD display. The line contains the configuration function codes described below.	
	DEVICE STATUS "M" OR "E"	In the event of a system error (= "E"), a 4-digit error code is displayed Shows a malfunction or system error.	
KEYS ON FRONT	The five keys on the front  Abort,  Arrow down,  Arrow up,  OK and  Scroll can be used for operation.		



8 Operating overview








Programming can be performed directly at the device or via a PC USB interface by using the configuration software E3DM (see instructions for use IM 507 D).

As soon as voltage is applied, the device is in measuring mode.










Pressing the  key for at least 5 seconds causes the flow correction calculator to switch to the configuration mode, in which the configuration is displayed or can be programmed. The measured value display is switched off and the first configuration code appears in the programming code display.

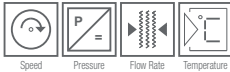
8.1 Operating overview in measurement mode

In measurement mode, operation is performed by means of the five keys on the front according to the following scheme:


	ABORT	Stops automatically measurement value switching → The measured value display mode currently selected remains active
	ARROW DOWN	Switching of measured value display mode Interruption of automatic run-through of measured value display modes → Auto mode with key 
	ARROW UP	Switching of measured value display mode Interruption of automatic run-through of measured value display modes → Auto mode with key 
	OK	No effect in measurement mode
	SCROLL	5-second configuration mode: → Current configuration → Programming mode Auto mode for measured value display










8.2 Operating overview in configuration mode

	ABORT	Switches from configuration mode to measurement mode
	ARROW DOWN	Selection of configuration function
	ARROW UP	Selection of configuration function
	OK	Pressing the  key has no effect in the configuration mode
	SCROLL	Switches programming mode for configuration function: Setting via  or  → Confirmation with 






8.3 Operating overview in programming mode

Pressing the  key switches the displayed configuration function code to programming mode. The first line of the measured value display shows the previous value of the configuration function. The new value can be entered in the second line of the measured value display.

	ABORT	Switches from configuration mode to measurement mode.
	ARROW DOWN	Selection of configuration function
	ARROW UP	Selection of configuration function
	OK	Pressing the  confirms the programming
	SCROLL	Switches Programming mode to configuration function: Setting via  or  → Confirmation with 








9 Configuration function codes

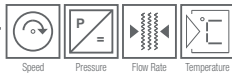
As described in 8, the device can be switched to configuration mode by pressing the  key for at least 5 seconds. The measured value display is switched off and the first configuration code appears in the programming code display. Pressing the keys  or  switches between the configuration function codes listed below. Once the end or beginning of the code list has been reached, no more switching takes place. Switching can only take place in the opposite direction.

Please note:

The configuration function codes may be protected with a 4-digit code for the various user groups. In this case, you will only be able to view the configuration function codes for the user group ALL. For enabling user groups OEM or SRV, you need to enter the corresponding code under configuration function code 50 – PIN entry.

Functions within configuration codes

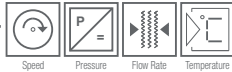
- You can change the preset values by pressing the  key within a configurable configuration code.
- By pressing the keys  or , you can continue switching the relevant display in the configuration menu. Fast scrolling can be performed by holding down the key. The longer you press the key, the faster the display changes. The value selected remains active until the keys  or  are pressed or fine-tuning has taken place or programming has been confirmed by means of the  key.
- Where programming is not completed within the preset time or is cancelled by pressing the  key, the timeout function cause programming to be aborted. The change is not stored.



9.1 Types of configuration function codes

CODE	DESCRIPTION	ACCESS	ADJUSTMENT RANGE	STEP
0001	Device ID	ALL	-	-
0003	SW version & BUILD ID	ALL	-	-
0004	SW version communication subsystem ¹⁾ / Ethernet subsystem ¹⁾	ALL	-	-
0005	Operating hours	ALL	-	-
0006	Serial number	ALL	-	-
0007	Ethernet IP address ¹⁾	ALL	-	-
0008	Ethernet subnet mask ¹⁾	ALL	-	-
0009	Ethernet gateway address ¹⁾	ALL	-	-
0010	Ethernet MAC address ¹⁾	ALL	-	-
0015	Trigger Ethernet broadcast ¹⁾	ALL	0-1	1
0020	Display device time	ALL	-	-
0050	PIN entry ²⁾	ALL	0000-9999	1
0051	Service PIN ²⁾	SRV	0000-9999	1
0052	OEM PIN ²⁾	OEM	0000-9999	1
0053	Parameter code ²⁾	SRV	0000-9999	1
0054	Parameter index ²⁾	SRV	0000-9999	
0055	Parameter value ²⁾	SRV	$-2^{31} \pm (2^{31} - 1)$	1*
The codes 0056 to 6049 are nor used for the device FMP				
6050	Number of poles A	SRV		1
6051	Number of poles B	SRV		1

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9.2 Description of individual configuration function codes

Configuration function code 0001 - Device ID

Device ID is shown in the measured value display.
The device ID cannot be changed; it is specified ex factory.

Access group: User identification by means of a PIN is not required.

Configuration function code 0002 - Available options

The available options are shown in the measured value display. The options are preceded by a hyphen in each case, resulting in several options being separated from each other as well. The end of the list of available options is represented by two consecutive decimal points. If the list of available options is too long to be shown in the first line of the measured value display, pressing the keys ▲ or ▼ will continue switching the display.
The available options cannot be changed; they are specified ex factory.

Access group: ALL

Configuration function code 0003 - SW version & BUILD ID

The first line of the measured value display shows the software version and the second line shows the BUILD ID of the software installed in the device.
The software version and BUILD ID cannot be changed; the information is specified ex factory.

Access group: ALL

Configuration function code 0004 - SW version communication subsystem

Where this is available as an option, the software version of the PLC is displayed in the first line. The second line contains the software version for the Ethernet subsystem.
The software version communication subsystem cannot be changed; the information is specified ex factory.

Access group: ALL

Configuration function code 0005 - Operating hours

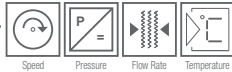
The first line of the measured value display shows the total counter reading for the operating hours.
The operating hours reading cannot be changed.

Access group: ALL

Configuration function code 0006 - Serial number

The first line displays the serial number.
The serial number cannot be changed.

Access group: ALL



Configuration function code 0007 - Ethernet IP address

Where this is available as an option, the IP address of the device is displayed.
The IP address cannot be changed.

Access group: ALL

Configuration function code 0008 - Ethernet subnet mask

Where this is available as an option, the Ethernet subnet mask of the device is displayed. The subnet mask cannot be changed.

Access group: ALL

Configuration function code 0009 - Ethernet gateway address

Where this is available as an option, the Ethernet gateway address of the device is displayed.

Access group: ALL
The gateway address cannot be changed.

Configuration function code 0010 - Ethernet MAC address

Where this is available as an option, the Ethernet MAC address of the device is displayed.
The MAC address cannot be changed.

Access group: ALL

Configuration function code 0015 - Trigger Ethernet broadcast

Where the Ethernet option is available, EDIT is shown in the first line of the display. The display in the second line 0000 can be edited.

The subnet mask cannot be changed.

Access group: ALL
Adjustment range: 0-1
Step: 1

Configuration function code 0020 - Show device time

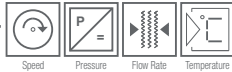
The first line of the display shows the device time comprising the date and time.
The device time cannot be changed.

Access group: ALL

Configuration function code 0051 - PIN entry

Where identification of the user was correctly completed by entering the user PIN, all configuration function codes for the access group ALL are enabled for viewing/modifying until the configuration mode is exited.

Access group: ALL
Adjustment range: 0000 ... 9999
Step: 1



Configuration function code 0052 - OEM PIN

Where identification of the user of the OEM user group was correctly completed by entering the OEM PIN, all configuration function codes for the access groups ALL, SRV and OEM are enabled for viewing/modifying until the configuration mode is exited.

Access group: OEM
Adjustment range: 0000 ... 9999
Step: 1

Configuration function code 0053 – Parameter code

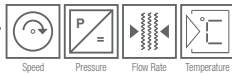
In order to select the parameter, the parameter code has to be set in the input mask:

Access group: SRV
Adjustment range: 0000 – 9999
Step: 1

Configuration function code 0055 – Parameter code

In order to select the parameter, the parameter code has to be set in the input mask:

Access group: SRV
Adjustment range: 0000 - 9999
Step: 1

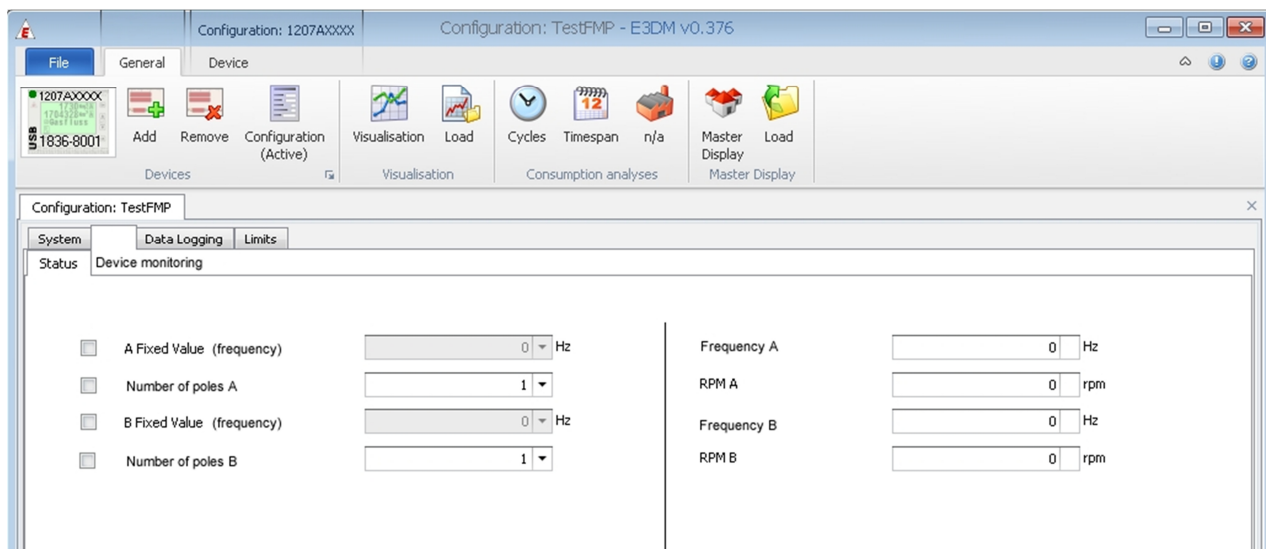


10 Configuration using the software E3DM

The software E3DM is used to set the required parameters (6051-6052) and the limitators for the limit value monitoring. Connect the FMP 1836 using the USB cable with the computer and start the program E3DM.

If other interfaces (e.g. Ethernet TCP/IP) are integrated into the FMP 1836, the software can use these ones for communication.

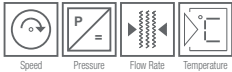
After the start of E3DM the software detects the device automatically and adds it to the device list. After selecting the FMP 1836 from the device list the following parameters can be set:



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The following table shows the possible settings:

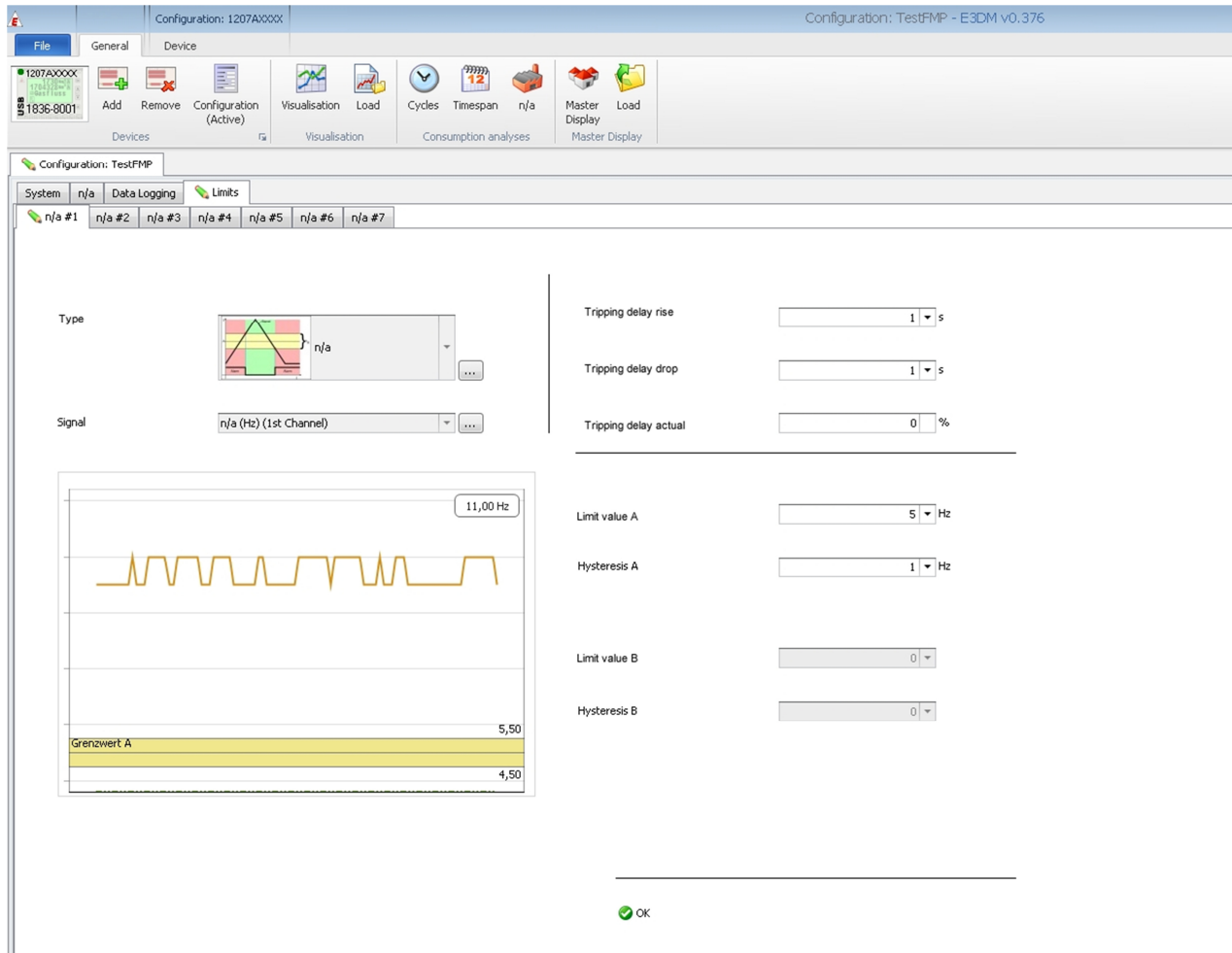
CODE	DECIPTION	DECIPTION	STEP
	frequency A fixed value	manual frequency set point	1
6050	number of poles A	required for translation in to RPM	1
	frequency B fixed value	manual frequency set point	1
6051	number of poles B	required for translation in to RPM	1
	frequency A	signal A	1
	RPM A	Example: number of poles (A)=1, signal(A)=10Hz: → number of poles x signal(Hz) x 60(s) = RPM A	1
	frequency B	signal B	1
	RPM B	Example: number of poles (B)=1, signal(B)=10Hz: → number of poles x signal(Hz) x 60(s) = RPM B	1



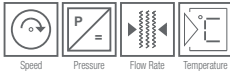
11 Monitoring with E3DM

Limit value monitoring

During the runtime the measurement channels can be monitored with E3DM. Limitators can be used to define limit values which will be monitored automatically. The following image shows the software menu for limit values (Configuration: xxx → Limits → n/a # 1-7).

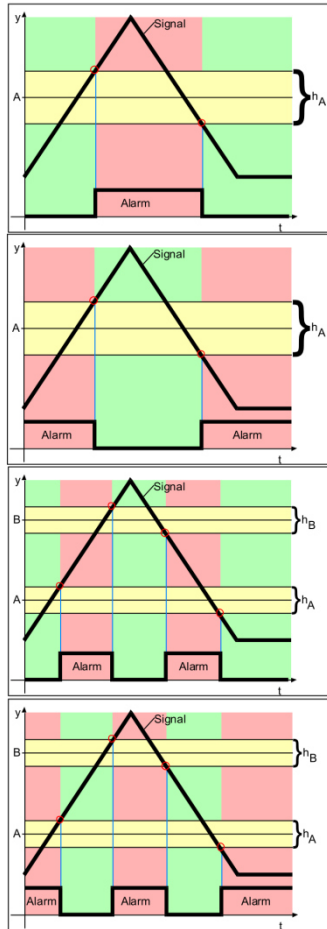


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Five types of limitators are included:

OFF



Tuned off

Overrange: alarm if value exceeds the set limit value (only threshold switch A)

Underrange: alarm if value falls short the set limit value (only threshold switch A)

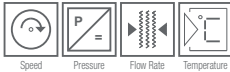
Band: alarm if value is between the limit value range (threshold switch A and B)

Notch: alarm if value is not in between the limit range (threshold switch A and B)

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The graphical display within the menu shows the actual measured values in correlation to the set parameters. The following table explains the differences:

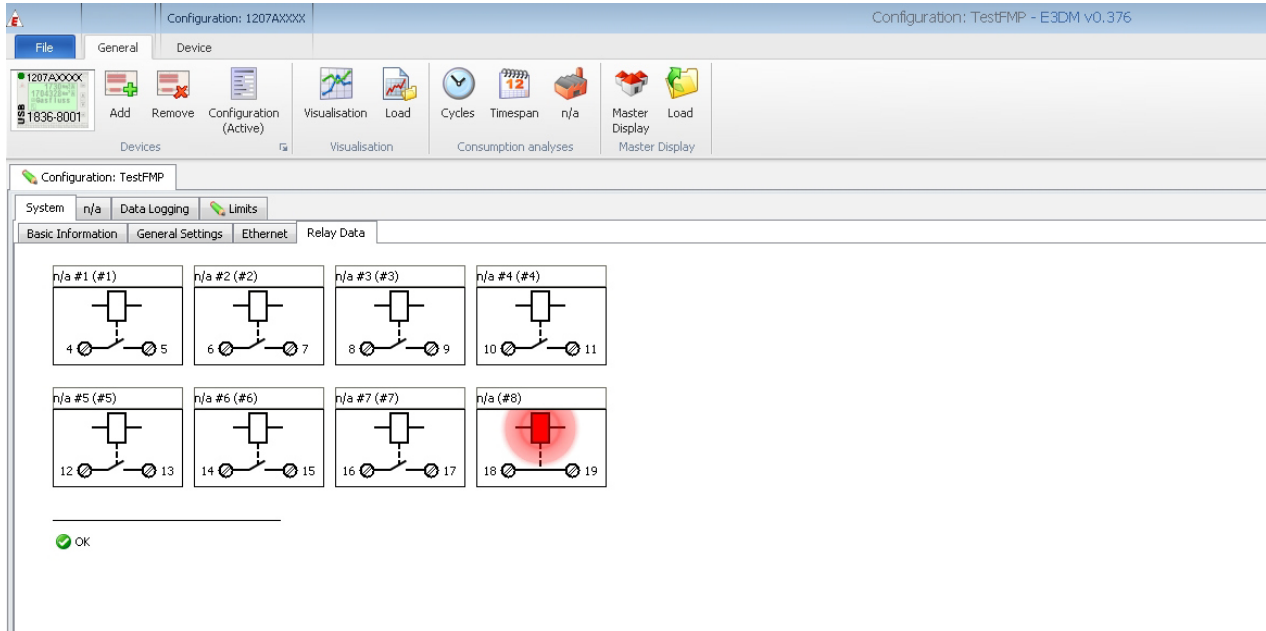
NAME	DESCRIPTION
limitator type	see table above
signal	selection signal channel „A“ or „B“ as the source of the limitators
tripping delay rise	delay until limitator is activated
tripping delay drop	delay until limitator is activated
tripping delay actual	delay until limitator is activated
limit value A	center of the hysteresis band (available for overrange, underrange)
hysteresis A	defined frequency band around limit value A
Limit value B	center of the hysteresis band (available for overrange, underrange)
hysteresis B	defined frequency band around limit value B



Remark: The threshold „A“ must be below the threshold „B“ (only for modus „Notch“ and „Band“).

Relay monitoring

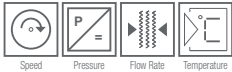
The device shows the status of a limiter with a changing relay status if a limit value violation occurs (relay #1 - #7). Additionally the device status “device alert” is displayed using relay #8. The following picture shows further details:



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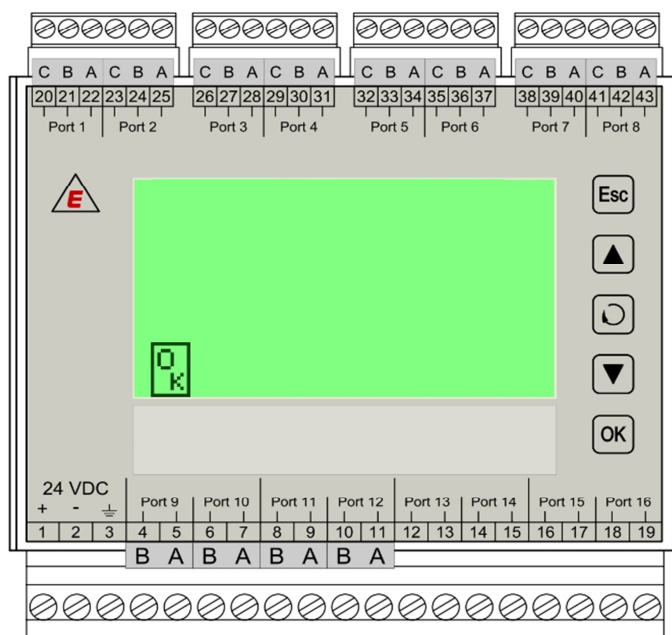
The relays are assigned according the following table:

TYPE	DESCRIPTION
relay #1	NO contact – limit value violation #1
relay #2	NO contact – limit value violation #2
relay #3	NO contact – limit value violation #3
relay #4	NO contact – limit value violation #4
relay #5	NO contact – limit value violation #5
relay #6	NO contact – limit value violation #6
relay #7	NO contact – limit value violation #7
relay #8	NO contact – device alert #8



12 Connecting diagram

Wiring recommendation: preferably 0,5 mm², max. 0,75 mm²



Wiring recommendation: preferably 1 mm², max. 1,5 mm²

IE pulse width

max. 1 kHz,
pulse width > 5 ms,
max. 20 V/DC

U _{B+}	E	↓
C	B	A

Supply voltage	RS Relay output																												
<table border="1" style="margin: 0 auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">24 V/DC</td> <td style="padding: 2px;"> </td> <td style="padding: 2px;">±</td> </tr> <tr> <td style="padding: 2px;">+</td> <td style="padding: 2px;">-</td> <td style="padding: 2px;">±</td> </tr> <tr> <td style="padding: 2px;">1</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">3</td> </tr> <tr> <td style="padding: 2px;">+</td> <td style="padding: 2px;">-</td> <td style="padding: 2px;">±</td> </tr> </table>	24 V/DC		±	+	-	±	1	2	3	+	-	±	<table border="1" style="margin: 0 auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">K 1</td> <td style="padding: 2px;">K 2</td> <td style="padding: 2px;">K 3</td> <td style="padding: 2px;">K 4</td> </tr> <tr> <td style="padding: 2px;">Port 13</td> <td style="padding: 2px;">Port 14</td> <td style="padding: 2px;">Port 15</td> <td style="padding: 2px;">Port 16</td> </tr> <tr> <td style="padding: 2px;">12</td> <td style="padding: 2px;">13</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;">15</td> </tr> <tr> <td style="padding: 2px;">16</td> <td style="padding: 2px;">17</td> <td style="padding: 2px;">18</td> <td style="padding: 2px;">19</td> </tr> </table>	K 1	K 2	K 3	K 4	Port 13	Port 14	Port 15	Port 16	12	13	14	15	16	17	18	19
24 V/DC		±																											
+	-	±																											
1	2	3																											
+	-	±																											
K 1	K 2	K 3	K 4																										
Port 13	Port 14	Port 15	Port 16																										
12	13	14	15																										
16	17	18	19																										
24 V/DC ±3 V/DC	30 V/DC, 1 A																												

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NAME	CLAMP	ASSIGNMENT
L, N, PE	1, 2, 3	power supply
port 9	4, 5	relay „limit value violations #1“
port 10	6, 7	relay „limit value violations #2“
port 11	8, 9	relay „limit value violations #3“
port 12	10, 11	relay „limit value violations #4“
port 13	12, 13	relay „limit value violations #5“
port 14	14, 15	relay „limit value violations #6“
port 15	16, 17	relay „limit value violations #7“
port 16	18, 19	relay „device OK / device alert“
port 1	20, 21, 22	frequency „A“
port 2	23, 24, 25	frequency „B“

