



# Parameterisable compact fault annunciator with permanent display



## → FSM 10 Drop-flap fault annunciator

- › Permanent display even on power failure
- › Compact module for 10 alarms
- › Supply and alarm signal voltage 12 V...250 V AC/DC
- › Indication with 10 green indicating discs with green LED
- › Live contact and nonvolatile history- / eventmemory ( time resolution 5 ms )
- › 4 output relays and 4 programmable buttons, 6 functional inputs
- › 2 parameterisable collective reports and internal horn
- › Parameterisation via DIP switches or PC programm
- › Pluggable connection terminals ( Screw- or spring cage terminals )
- › Marker strips pocketable into transparent window

→ [Data sheet](#)

## → Functional description

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The compact FSM 10 drop-flap fault annunciator is installed in a housing for panel-mounting according to DIN 43781. It has 10 green indicating discs, each featuring a LED for displaying the signals. With very compact design, the fault annunciator offers energy-independent long-term storage of active signals via bi-stable mechanical indicating elements. No battery backup is required. The messages are clearly visible at any time irrespective of lighting conditions. The integrated event memory, which can be read via the serial interface, enables simple archiving of events. Via the optional printer, the events can be documented immediately or at the push of a button.

The drop-flap fault annunciator comprises the following functional components:

- 10 indicator elements with integrated LED
- 10 galvanically separated reporting inputs (E1 ... E10)
- 6 galvanically separated, freely parameterisable function inputs (F1... F6), e.g. acknowledgement, printer control etc.
- Alive LED
- 4 programmable output relays with change-over contacts (R1 ... R4)
- 4 programmable buttons (e.g. acknowledgement, printer control, lamp test etc.)
- 10 DIP switches for basic parameterisation
- 2 CAN bus connection sockets for parallel connection up to 4 fault annunciators (flashing synchronisation, joint acknowledgement, lamp test etc.) and the connection of expansion modules
- RS 232 interface for connecting a laptop (parameterisation, reading the event memory) or for connecting a serial printer
- real-time clock with battery backup and connection socket for external DCF 77 aerial
- various Status LEDs (RS 232, DCF77, CAN BUS)

A maximum of 4 FSM 10 can be networked via the CAN bus and thus consolidated to form a group. This leads to a system, in which all 40 reporting inputs, 16 keys and 24 function inputs can be processed in each individual component.

The fault annunciator can realise different reporting procedures. The options range from simple standards, such as first or new-value messaging, to complicated application-specific procedures. The indicating disks, associated LEDs and output relays are controlled and the effect of the keys and function inputs determined depending on the alarm sequence. In the basic fault annunciator parameterisation, the device can be set to the most common reporting procedures via DIP switch. Additional setting options are available through software parameterisation, enabling very flexible adaptation of the fault annunciator to almost any task. For example, two reporting groups may be formed that can even realise different reporting procedures.

## → Application examples

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- Climate control supervision in railroad vehicles
- Food supervision
- Monitoring of transformer and stationary or mobile emergency power generators
- Industry and chemical plants
- Replacement of conventional drop flap relays

## → Configuring via DIP switch

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In the delivery state, the fault annunciator is pre-parameterised and in most cases can therefore easily be adapted to a particular application via the DIP switches provided at the rear. The following basic settings apply:

- reporting sequence ( first-up value / new value )
- triggering of the inputs 1 ... 5 with NO or NC contacts
- triggering of the inputs 6 ... 10 with NO or NC contacts
- collective report 1 standard or inverted
- collective report 2 standard or inverted
- automatic horn acknowledgement „on“ or „off“
- horn suppression with follow-up message „on“ or „off“
- unit No. (1...4)



## → Parameterising via PC

In order to adapt the fault annunciator to a wide range of different applications, the following parameter can be modified additionally:

- delay times for each individual alarm input
- NC or NO processing for each individual alarm input
- assignment of the inputs to the two reporting groups
- definition of the reporting procedure for the reporting groups
- definition of the key functions and function inputs
- assignment of relay function to the outputs (e.g.  $\Sigma 1..2$ , horn 1, horn 2, alive message)
- horn sounding duration with automatic acknowledgement

## → Logging

Appearing events will be logged with a time stamp in the non-volatile event memory. Thereby parameters can be assigned which events are to be logged.

- incoming message
- receding message
- button or function input activated
- incoming first value
- incoming supply voltage
- receding supply voltage

The data sets of the history file can be distributed over keystroke or activation through one of the function inputs over the RS 232 interface. A version in the ASCII format and the drive of a printer are possible. Different printer drivers are available.

```
Do 15.01.2004 17:18:36.70 Logging print Transformer station 1
Do 08.01.2009 17:09:48.64 Triggered function „print out“
Mi 07.01.2009 08:30:26.95 Receding alarm 110 kV
Mi 07.01.2009 08:15:25.54 Acknowledgement alarm
Mi 07.01.2009 08:15:24.56 Acknowledgement horn
Mi 07.01.2009 08:15:19.75 Upcoming alarm 110 kV
```

On request we supply you with your custom predefined parameter settings for your application.

## → Alarm sequence

- new-value sequence with 1-frequency flashlight and single acknowledgement
- first-up-value sequence with 1-frequency flashlight and single acknowledgement
- new-value sequence with 2-frequency flashlight and single/double acknowledgement
- first-up-value sequence with 2-frequency flashlight and single/double acknowledgement

The indicating discs are always green when the corresponding LED flashes or shines steadily.

Further information to the integrated alarm sequences can be found in the separate document "Alarm sequences of the EES fault annunciators" (Filename "SM-MA-ZI-UK").

## Collective report

Collective report	Function	Meaning
1	static / parallel to input	The collective report is set by the first upcoming alarm and is still active as long as there is an alarm lining up. It is reset automatically without acknowledgement when all alarms have gone.
2	static / parallel to output	The collective report is set when an alarm is upcoming and only resets if all alarms have been gone and been acknowledged.

## Horn triggering

Function	Description	Meaning
Horn triggering (adjustable per DIP-switch)	retriggerable	Horn will be retriggered, even if there are messages already lining up.
	not retriggerable	Horn will only be retriggered, if no messages are longer present
Horn acknowledge- ment	manual ( continuous tone )	Horn will be acknowledged manually via button or on functional input.
	automatic ( pulse tone )	Horn will be acknowledged according to the preset time
Horn locking	none	Horn can always be acknowledged
	Message acknowledgement	Horn acknowledgement is only possible after acknowledging the message

## → Technical data

Type	FSM 10- 0/12AD/12AD/12AD/0	FSM 10- 0/24AD/24AD/24AD/0	FSM 10- 0/60AD/60AD/60AD/0
Article no.	58FSM1000000	58FSM1001110	58FSM100E330
Supply voltage Rated voltage Range	12 V AC/DC 10 ... 19 V DC 8 ... 13 V AC	24 V AC/DC 19 ... 37 V DC 14 ... 26 V AC	48 V AC/DC + 60 V DC 37 ... 73 V DC 26 ... 51 V AC
Insulation of the supply voltage against all other voltages	500 V <sub>RMS</sub>	500 V <sub>RMS</sub>	500 V <sub>RMS</sub>
Voltage of the reporting and func- tion inputs Rated voltage Range	12 V AC/DC 9 ... 35 V AC/DC	24 V AC/DC 18 ... 50 V AC/DC	48 and 60 V AC/DC 28 ... 75 V AC/DC
Input resistance	approx. 5 kΩ	approx. 10 kΩ	approx. 22 kΩ



Type	FSM 10-0/110AD/110AD/110AD/0	FSM 10-0/220AD/220AD/220AD/0
Article no.	58FSM1004440	58FSM1005550
Supply voltage Rated voltage Range	110 V AC/DC 100 ... 370 V DC 85... 264 V DC	220 V AC/DC 100 ... 370 V DC 85... 264 V DC
Insulation of the supply voltage against all other voltages	3 kV <sub>RMS</sub>	3 kV <sub>RMS</sub>
Voltage of the reporting and function inputs Rated voltage Range	110 V AC/DC 55 ... 130 V AC/DC	220 V AC/DC 150 ... 260 V AC/DC
Input resistance	approx. 70 kΩ	approx. 200 kΩ

Other voltages can also be supplied on demand.

<b>Power consumption</b>	typically 1 – 2 W; short-time max. 4 W
<b>Response delay</b>	5 ms ... approx. 1 min; standard setting 100 ms*
<b>Horn sounding duration</b>	
with automatic acknowledgement	1 ... 255 s; standard setting 10 s
<b>Load capacity of relay contacts</b>	
minimum	1.2 V or 1 mA (> 50 mW)
maximum	250 V AC / 1 A (2 A with pure ohmic load) 30 V DC / 2 A 110 V DC / 0.2 A 220 V DC / 0.1 A
<b>LED flashing frequency</b>	
Flashing	1 Hz
Slow flashing	0,5 Hz
<b>Insulation voltage</b>	
<b>Reporting and function inputs</b>	
against all other voltages	4 kV <sub>RMS</sub>
Functional inputs 1 ... 3 against 4 .. 6	2.5 kV <sub>RMS</sub>
<b>Relay contacts</b>	
against all other voltages	4 kV <sub>RMS</sub>
against each other	500 V
<b>Potential difference between the neutral conductor of the reporting groups</b>	
Signal input 1 ... 5 and 6 ... 10	50 V
<b>Mechanical data</b>	
Front frame	96 x 96 mm; maximum installation depth 125 mm
Front panel aperture	91 x 91 <sup>+0,5</sup> mm
Mounting position	arbitrary
Weight	approx. 0.52 kg
<b>Environmental conditions</b>	
Operating and ambient temperature	-20°C ... +60°C without condensation (supply voltage < 110 V) -10°C ... +60°C without condensation (supply voltage ≥ 110 V)
Storage temperature	-20°C ... +70°C without condensation

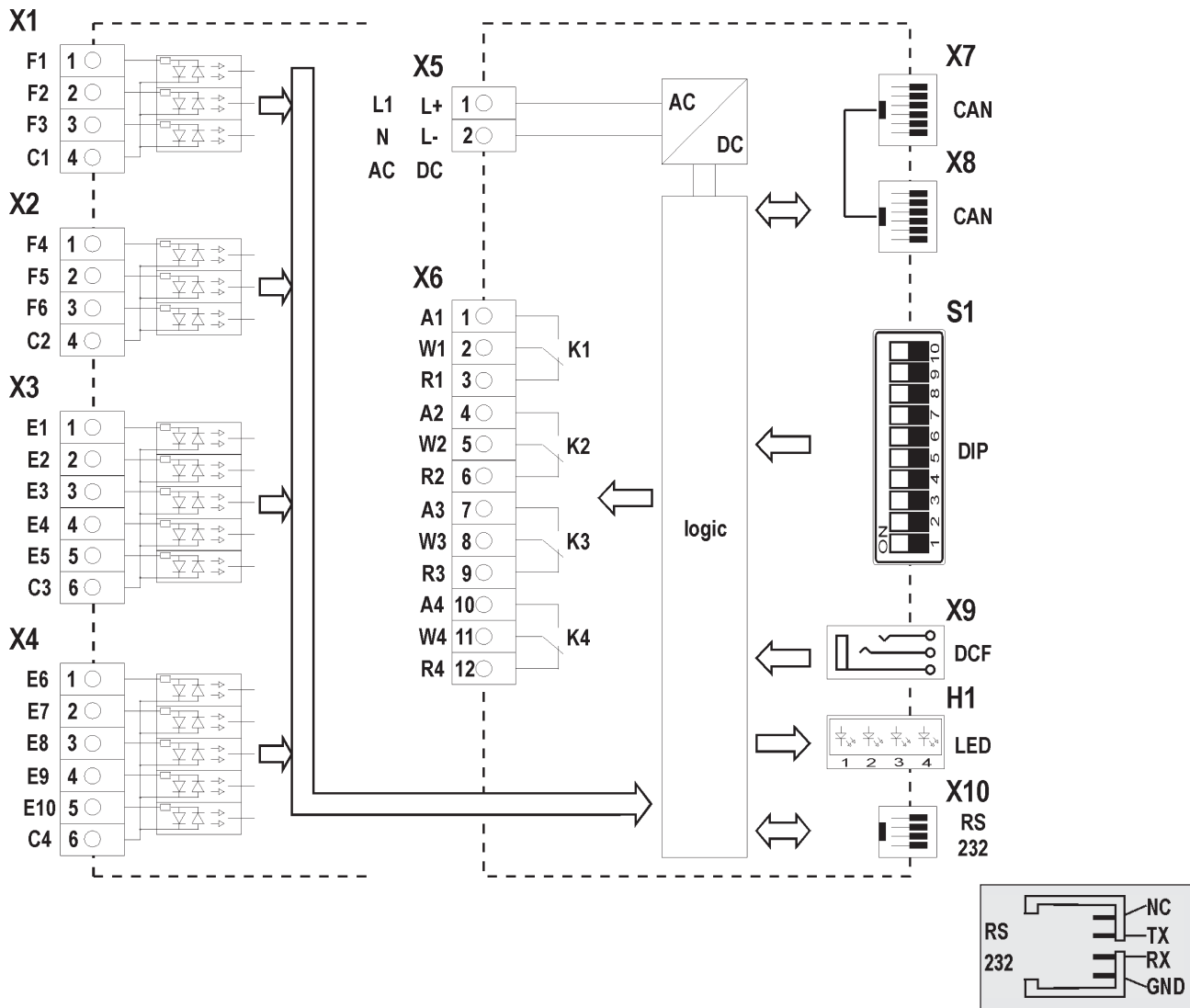
\* With alternating current (AC) the response delay in the lower signal voltage range can be increased in dependency of the signal form.

# FSM 10 DROP-FLAP FAULT ANNUNCIATOR

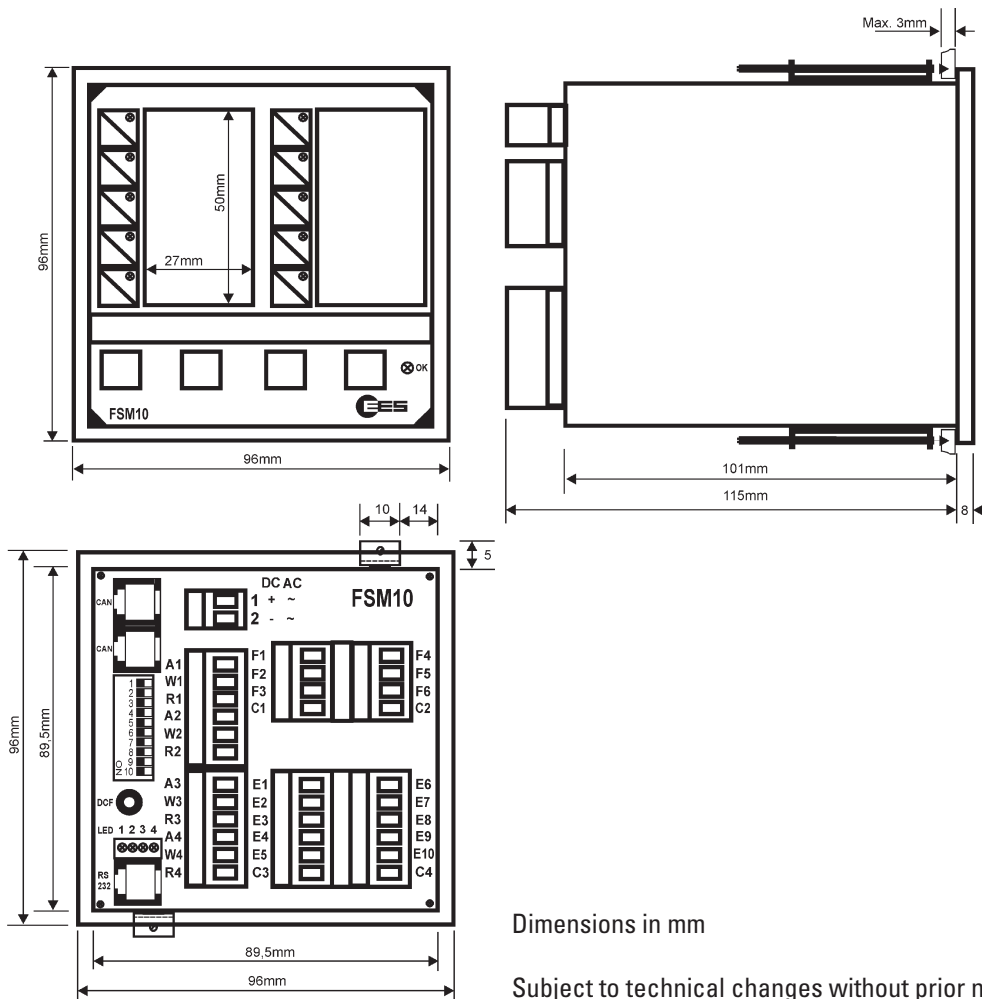
Protection class at the front	IP 54; IP 65 with transparent protective cover
Protection class at the rear	IP 20
Connection terminals	pluggable
Cross-section rigid or flexible	
without wire sleeves	0,2 ... 2,5 mm <sup>2</sup>
with wire sleeves	0,25 ... 2,5 mm <sup>2</sup>
Permissible relative humidity	= 75% on average over the year (group F DIN 40040)
Noise immunity	EMC tested according to EN 61000-4-2,4,5

The information given for alternating voltages are referring to a sinusoidal alternating voltage with a frequency of 50/60 Hz and all information on an ambient temperature of 25°C, otherwise noted.

## → Terminal assignments



→ Dimensional drawing



Dimensions in mm

Subject to technical changes without prior notice

→ Ordering codes

**Standard devices**

Article No	Type	Supply and signalling voltage
58FSM1000000	FSM 10-0/12AD/12AD/12AD/0	12 V AC/DC
58FSM1001110	FSM 10-0/24AD/24AD/24AD/0	24 V AC/DC
58FSM100E330	FSM 10-0/60DC/60AD/60AD/0	48 V AC/DC and 60 V DC
58FSM1004440	FSM 10-0/110AD/110AD/110AD/0	110 V AC/DC
58FSM1005550	FSM 10-0/220AD/220AD/220AD/0	220 V AC/DC

**Accessories**

Article No	Type	Specification
58ZPK2P/PC	Parameterisation cable for MSM-family	Cable length 1.5 m
KSH1	Transparent protection cover	IP 65
AN64	DCF77-Active antenna	Cable length 2.5 m
K104-1	CAN-Bus connecting cable	(FSM 10 - FSM 10), length 20 cm
K104-3	CAN-Bus connecting cable	(FSM 10 - FSM 10), length 50 cm

## → Do you need alternative fault annunciators or operation indicators ?



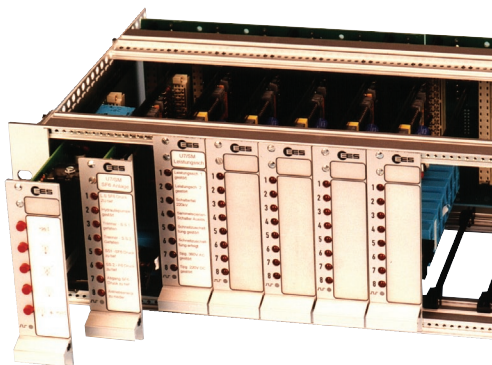
### LED - indication modules

- Compact module in a 96 x 96 mm housing for panel mounting
- 8 or 16 channels with exchangeable LED's
- Several alarm voltages in a range from 24 V up to 230 V
- Integrated lamp test push button
- Collective report optional
- Front panel marking: transparent window for slide-in labels
- Low built-in depth



### BSM - Panel mounting basic fault annunciators

- Devices with 8, 16, 32 and 48 Signal inputs
- Sealed front, protection class IP 54
- Integrated buttons, functional inputs and relay outputs
- Self monitoring
- Optional DIN rail modules for PCS contacts
- Optional Software-Parameterisation via PC
- Realisation of all common alarm sequences
- Extremely bright LED with great reading angle and in many colours



### U7 - series 19"- signalling system

- Alarm processing in larger intercommunication systems
- Modular 19" system can be extended to over 1000 alarms
- Supply voltage and alarm voltage 24 – 220 V
- Potential separation of all circuits
- LED-display per alarm
- Marker strip connectable to transparent window
- Integrated test and acknowledgement push-button
- Subrack with prewired, ready-to-connect rear PC-board
- All international alarm sequences optional

## → Contact