

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Alarm and electronic security systems – Social alarm systems –  
Part 2: Trigger devices**

**(standards.iteh.ai)**

**Systèmes d'alarme et de sécurité électroniques – Systèmes d'alarme sociale –  
Partie 2: Déclencheurs**

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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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Part 2: Trigger devices  
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ALARM AND ELECTRONIC SECURITY SYSTEMS –  
SOCIAL ALARM SYSTEMS –**

**Part 2: Trigger devices**

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International Standard IEC 62851-2 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This first edition is based on EN 50134-2:1999.

The text of this standard is based on the following documents:

FDIS	Report on voting
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Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62851 series, published under the general title *Alarm and electronic security systems – Social alarm systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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## INTRODUCTION

This standard is part of the IEC 62851 series of International Standards and Technical Specifications “Alarm and electronic security systems – Social alarms systems”, written to include the following parts:

- Part 1: System requirements
- Part 2: Trigger devices
- Part 3: Local unit and controller
- Part 5: Interconnections and communications
- Part 7: Application guidelines (under consideration)

A social alarm system provides 24 hours facilities for alarm triggering, identification, signal transmission, alarm reception, logging and 2-way speech communication, to provide reassurance and assistance for people living at home or at places under surveillance and considered to be at risk.

A social alarm system is comprised of a number of system parts which can be configured in different ways to provide this functionality.

A user can request assistance by the use of a manually activated trigger device resulting in an alarm triggering signal. In certain cases, alarm triggering signals can be generated by automatic trigger devices. A local unit or controller receives the alarm triggering signal, switching from the normal to the alarm condition and indicating this to the user (some systems use an optional pre-alarm condition that allows the user to reset the alarm for a short period of time).

The controller normally transmits the alarm condition to an Alarm Receiving Centre (ARC) via the alarm transmission system. The ARC can either be local to the controller or remote from the controller. The ARC has the facility to identify the local unit, alarm type and to then establish two-way speech communication between the alarm recipient and the user. The alarm recipient provides reassurance to the user and directs assistance where appropriate.

In some cases, the alarm may be diverted to an alarm recipient using a personal receiver. In this case, the alarm is identified to the alarm recipient and a two-way speech communication path established to the user and receipt of the alarm acknowledged to the controller. In all cases, the system records the time, date, location and type of alarm.

The system is designed to detect and report fault conditions affecting the transmission of alarms. In some cases, temporary disconnection of a local unit is possible to minimize faults or prevent alarms triggered inadvertently affecting the correct operation of the system.



# ALARM AND ELECTRONIC SECURITY SYSTEMS – SOCIAL ALARM SYSTEMS –

## Part 2: Trigger devices

### 1 Scope

This part of IEC 62851 specifies the requirements and tests for manually-activated trigger devices forming part of a social alarm system.

This International Standard only applies to manually-activated trigger devices that transmit the alarm triggering signal to a local unit or controller via cable or wire-free radio transmission, i.e.

- a) push button fixed;
- b) pull switch fixed;
- c) push button portable;
- d) pull switch portable.

This standard also gives guidance on automatically-activated trigger devices. For the requirements and tests applicable to such trigger devices, references are made to appropriate ISO/IEC standards for fire alarm, gas alarm and intruder alarm system components.

This standard does not specify EMC emission or electrical safety requirements. These are covered by other standards.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60341-1:1970, *Push button switches – Part 1: General requirements and measuring methods*<sup>1</sup>

IEC 61020-1:2009, *Electromechanical switches for use in electrical and electronic equipment – Part 1: Generic specification*

IEC 62599-1:2010, *Alarm systems – Part 1: Environmental test methods*

IEC 62599-2:2010, *Alarm systems – Part 2: Electromagnetic compatibility – Immunity requirements for components of fire and security alarm systems*

IEC 62851-1, *Alarm and electronic security systems – Social alarm system – Part 1: System requirements*

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<sup>1</sup> This publication was withdrawn and replaced by IEC 61020 series.

IEC 61779-1:1998, *Electrical apparatus for the detection and measurement of flammable gases – Part 1: General requirements and test methods*

IEC 61779-2:1998, *Electrical apparatus for the detection and measurement of flammable gases – Part 2: Performance requirements for group I apparatus indicating a volume fraction up to 5% methane in air*

IEC 61779-3:1998, *Electrical apparatus for the detection and measurement of flammable gases – Part 3: Performance requirements for group I apparatus indicating a volume fraction up to 100% methane in air*

IEC 61779-4:1998, *Electrical apparatus for the detection and measurement of flammable gases – Part 4: Performance requirements for group II apparatus indicating a volume fraction up to 100% lower explosive limit*

IEC 61779-5:1998, *Electrical apparatus for the detection and measurement of flammable gases – Part 5: Performance requirements for group II apparatus indicating a volume fraction up to 100% gas*

EN 54 (all parts), *Fire alarm system components (CEN standards)*

EN 300 220-2:2010, *Electromagnetic compatibility and Radio spectrum Matters (ERM) – Short range devices – Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW – Part 2: Supplementary parameters not intended for regulatory purposes*

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### 3 Terms and definitions

IEC 62851-2:2014

For the purposes of this document, the terms and definitions given in IEC 62851-1, as well as the following apply.

#### 3.1

##### **activity monitoring trigger device**

an alarm function that operates automatically when a routine activity of the user, being monitored by a trigger device, is modified or omitted within a specified period

#### 3.2

##### **fault warning signal**

any signal transmitted by a trigger device to indicate battery low or faulty condition of the trigger

#### 3.3

##### **fire alarm trigger**

a component of a fire detection system that provides an alarm triggering signal to be received and processed by the local unit and controller

#### 3.4

##### **fixed trigger device**

a trigger device in a fixed position in relation to the local unit or building

#### 3.5

##### **gas alarm trigger**

a component of a gas detection system that provides an alarm triggering signal to be received and processed by the local unit and controller

### 3.6

#### **interconnection**

a transmission system that provides the communication between trigger devices and local unit and controller

### 3.7

#### **portable trigger device**

a trigger device carried by the user and providing wire-free communication

### 3.8

#### **user**

a person living at home at risk

## 4 Manually-activated trigger devices

### 4.1 General requirements

A manually-activated trigger device may be fixed or portable. The requirements for the design, function and testing of the different types of manually-activated trigger devices are minimum.

- a) The fixed trigger device shall be capable of generating an alarm triggering signal, either by cable or wire-free means, which is capable of being decoded by the local unit or controller.
- b) The portable trigger device shall be capable of generating an alarm triggering signal, by wire-free means, which is capable of being decoded by the local unit or controller and distinguishable from fixed trigger devices and automatically-activated trigger devices.
- c) When the only function of a portable trigger is to be used as part of a social alarm system it shall be powered from primary (non-rechargeable) batteries.
- d) The wire-free radio transmitter type of trigger device and associated receiver or local unit or controller shall fulfil the requirements of the local countries appropriate radio regulatory requirements and any other standards that are applicable.
- e) The wire-free radio transmitter type of trigger device shall transmit an identification code with one out of a minimum of 256 different combinations when an alarm triggering signal is generated.

### 4.2 Functional requirements

#### 4.2.1 General

A trigger device shall be non-latching and require a single push or pull action by the user.

#### 4.2.2 Trigger device with internal primary batteries

Primary batteries shall have a capacity large enough to ensure correct functioning of the trigger device. After 12 months of normal operation, with 1 activation per day of the trigger device, it shall still be possible to generate an alarm output signal which is capable of being detected by the local unit or controller.

The trigger device shall be capable of generating a fault warning signal to the local unit or controller when the trigger is activated before the battery voltage has decreased to the lower limit specified for the d.c. supply input voltage ( $V_B$  min.) by the manufacturer.

#### 4.2.3 Trigger device with internal power supply connected to the a.c. mains and sealed rechargeable batteries

Requirements for trigger devices with internal power supply connected to the a.c. mains and sealed rechargeable batteries are the following:

- a) The power supply shall be capable of operating correctly within variations in the a.c. mains of +10 % to –15 % of the nominal voltage.
- b) Within the allowed variations of the a.c. mains voltage there shall be no discharge of the battery when the trigger device is in normal condition.
- c) If the a.c. mains is interrupted the trigger device shall automatically be switched to the battery without any disconnections of the supply current.
- d) The capacity of the fully charged battery shall be large enough to ensure correct functioning of the trigger device. After 24 h of battery operation in normal operating condition, it shall be possible to generate an alarm output signal which is capable of being detected by the local unit or controller.
- e) A fully discharged battery shall be recharged to at least 80 % of its nominal capacity within 24 h and to its rated capacity within another 48 h.
- f) The trigger device shall be capable of giving a fault warning signal to the local unit or controller within 2 h of the a.c. mains supply failure period.
- g) The trigger device shall have a visual indication of normal a.c. supply.

#### 4.2.4 Push button fixed or portable type

The trigger push button shall be more prominent than, and clearly distinguishable from, other buttons by colour and size.

#### 4.2.5 Push button fixed type

The trigger push button shall have a minimum trigger activation area of 200 mm<sup>2</sup> with a minimum dimension of not less than 5 mm.

#### 4.2.6 Pull switch fixed type

The pull switch type of trigger shall comprise of at least one handle connected to the pull switch body by a rigid or flexible link.

#### 4.2.7 Push button portable type

The trigger push button shall have a minimum activation area of 150 mm<sup>2</sup> with a minimum dimension of not less than 5 mm.

## 5 Test of manually-activated trigger devices

### 5.1 Test categories

The tests are divided into 3 categories:

- a) functional tests according to 5.5;
- b) wire-free radio transmission measurements according to 5.6;
- c) environmental tests according to 5.7.

### 5.2 Standard atmospheric condition for testing

Unless otherwise specified, the atmospheric condition in the laboratory shall be the standard atmospheric conditions for measurements and tests, specified in 5.3.1 of IEC 60068-1:1988 as follows:

- Temperature: 15 °C to 35 °C;
- Relative humidity: 25 % to 75 %;
- Air pressure: 86 kPa to 106 kPa (860 mbar – 1 060 mbar).

### 5.3 Number of trigger devices used for testing

Generally, sequential testing (the same trigger device used for all tests) is not required, but may be accepted if only a few trigger devices are available. Wherever possible a trigger device should only be subject to one endurance test. If more trigger devices are available, the time required for the testing, and the stress of the individual trigger devices, may be minimized.

The tests may be carried out in any order.

The required minimum number of the different types of trigger devices to be available for a test depends on the type of trigger device and the environmental group to be specified for that device (see 5.7.2).

It is recommended that three out of the total number of trigger devices available for the type testing are always designated for the functional tests and that a further three devices are designated for the free field transmission test if the trigger device uses wire-free transmission.

### 5.4 General conditions for tests

#### 5.4.1 Triggers using cable transmission

##### 5.4.1.1 Mounting and orientation

Unless otherwise stated in a test procedure, the trigger device under test shall be mounted in its normal orientation by the normal means of mounting indicated by the manufacturer, and except where required for functional testing, the trigger device shall be in its normal condition (not activated).

##### 5.4.1.2 Electrical connections IEC 62851-2:2014

The test set-up used during functional and environmental tests depends on the type of power source and the type of alarm output circuit used for the trigger device.

- a) If the test procedure requires the trigger device to be in the operating condition, it shall always be connected to the a.c. mains or powered with d.c. from internal or external power supply, or from the local unit or controller, as specified by the manufacturer.
- b) Unless otherwise required in the test procedure the a.c. mains voltage or d.c. supply voltage for the trigger device under test shall be adjusted to its nominal value.
- c) The trigger device shall, unless otherwise stated in the test procedure, signal to an appropriate local unit or controller. During some of the function tests, or if the trigger device is only a contact function in a fixed trigger device, it may signal to a test equipment which is able to monitor the status of the trigger device.
- d) If the trigger device is provided with separate outputs for external indicators or control circuits, except for outputs to the local unit or controller, it shall also be possible to monitor these outputs during testing.

#### 5.4.2 Triggers using wire-free transmission

##### 5.4.2.1 Mounting and orientation

Unless otherwise stated in the test procedure, the trigger device under test, as well as the local unit or controller used for functional testing, shall be mounted in test fixtures and interconnected as described in Annex C (normative), during the functional tests as well as during the environmental tests.

##### 5.4.2.2 Electrical connections

Unless otherwise specified trigger device shall be provided with fresh batteries before start of testing.

As the local unit or controller is not part of the test specimen, the local unit or controller shall be powered, during all tests, with the nominal a.c. or d.c. supply voltage as specified by the manufacturer.

## 5.5 Functional tests

### 5.5.1 Triggers using cable transmission

#### 5.5.1.1 Power supply powered from primary (non-rechargeable) batteries

$V_B$  max.,  $V_B$  nom. and  $V_B$  min. used in the functional test below shall be specified by the manufacturer prior to the testing.

- a) Disconnect the batteries and power the trigger device from an external variable d.c. supply.
- b) With the d.c. supply voltage adjusted to nominal battery voltage  $V_B$  nom. check that the trigger functions correctly in normal (output not activated) condition as well as alarm (output activated) condition.
- c) Repeat b) with the d.c. supply voltage adjusted to maximum battery voltage  $V_B$  max.
- d) Adjust the d.c. supply voltage to the minimum battery voltage  $V_B$  min.  $\pm 1$  % as specified by the manufacturer of the trigger device, and check that the trigger functions correctly. Activate the trigger device and check that it goes into alarm condition (output activated) and that the battery low warning signal is initiated.

#### 5.5.1.2 Measurements of contact and insulation resistances for mechanical contact function

This subclause only applies to trigger devices if the alarm output circuit of the trigger device is a mechanical contact function (e.g. mechanical switch or relay) with no electronic circuits used for fault monitoring or for generating the output alarm.

The contact and insulation resistances shall be measured according to Annex A (normative) for all test samples delivered for testing before the start of any other tests.

Criteria for compliance:

- a) For each type of contact in the trigger device, the contact resistance measured by each of the measurements shall be less than 100 m $\Omega$ . Possible faults experienced during the measurements shall also be noted in the test report.
- b) For each type of contact in the trigger device, the insulation resistance shall be not less than 10 M $\Omega$ .

### 5.5.2 Triggers using wire-free transmission

#### 5.5.2.1 General

Unless otherwise specified the function tests are carried out with the trigger device and the local unit or controller mounted in the rf-shielded test fixtures as described in 5.4.2.

NOTE If this is not possible during certain tests, care is taken to prevent all unwanted radio signal interferences from activating the local unit or controller e.g. testing in a shielded room.

#### 5.5.2.2 Power supply powered from primary (non-rechargeable) batteries

$V_B$  max.,  $V_B$  nom. and  $V_B$  min. used in the functional test below shall be specified by the manufacturer prior to the testing.

- a) Disconnect the batteries and power the trigger device from an external variable d.c. supply.

The trigger device and local unit shall be mounted in its normal orientation and the shielded test fixtures shall not be used.

Before the test is started ensure that a fault warning or alarm triggering signal transmitted from the trigger device will be received and decoded by the local unit or controller.

- b) With the d.c. supply voltage adjusted to nominal battery voltage  $V_B$  nom. check that the trigger functions correctly in normal (output not activated) condition as well as alarm (output activated) condition.
- c) Repeat b) with the d.c. supply voltage adjusted to maximum battery voltage  $V_B$  max.
- d) Adjust the d.c. supply voltage to the minimum battery voltage  $V_B$  min.  $\pm 1$  % as specified by the manufacturer of the trigger device, and check that the trigger functions correctly. Activate the trigger device and check that it goes into alarm condition (output activated) and that the battery low warning signal is initiated.

### 5.5.3 Fixed trigger type

The following requirements are necessary:

- a) The charger shall be able to charge the battery automatically.
- b) A battery discharged to its final voltage shall be recharged to at least 80 % of its rated capacity within 24 h and to its rated capacity within another 48 h.
- c) The charging characteristics shall automatically be regulated as a function of ambient air temperature within the battery manufacturer's specification over the ambient temperature range of the battery.
- d) There shall be no current consumption from the battery when the trigger power supply is powered from the a.c. mains with voltage variations between +10 % to –15 % of its nominal value and the trigger device in normal condition.

### 5.5.4 Portable trigger with neckband relief (anti-strangle) device

Portable devices with a neck band shall incorporate a strain relief (anti-strangle) device which shall break when subjected to a certain force. During this test the trigger device shall be mounted in its normal orientation.

The test jig as shown in Figure B.1 is used for testing of the strain relief with the following criteria for compliance:

- a) the anti-strangle device shall not be in contact with the fixed pivots during testing;
- b) when a force of 25 N is applied vertically downwards for 60 s the strain relief device shall not break;
- c) when a force of 40 N is applied vertically downwards the strain relief device shall break within 5 s.

### 5.5.5 Push button fixed trigger types

#### 5.5.5.1 General

Unless otherwise stated in this subclause all the forces shall be constantly applied for 4 s or until the trigger device is activated during the 4 s. If the trigger device is activated by the force this shall occur within the first 2 s after the force is applied.

#### 5.5.5.2 Activation force limits

The button shall activate the trigger device with a force of 5 N or more and it shall not activate the trigger device with a force of 1 N or less when tested as follows:

- a) with a 10 mm diameter rigid rod with a hemispherical end positioned over the centre of the button, and a force of 1 N applied on the axis of operation neither the switch nor the trigger device shall activate;