User manual

ABB i-bus® EIB

Zone Terminal MT/S 4.12.1

Intelligent Installation System

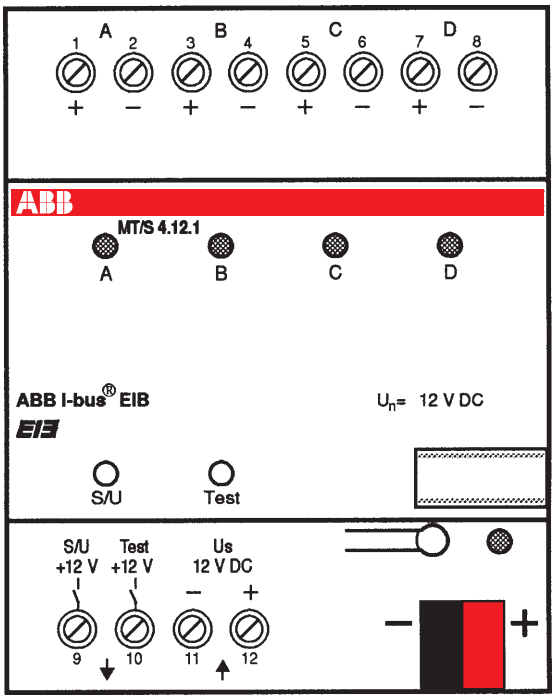


ABB STOTZ-KONTAKT

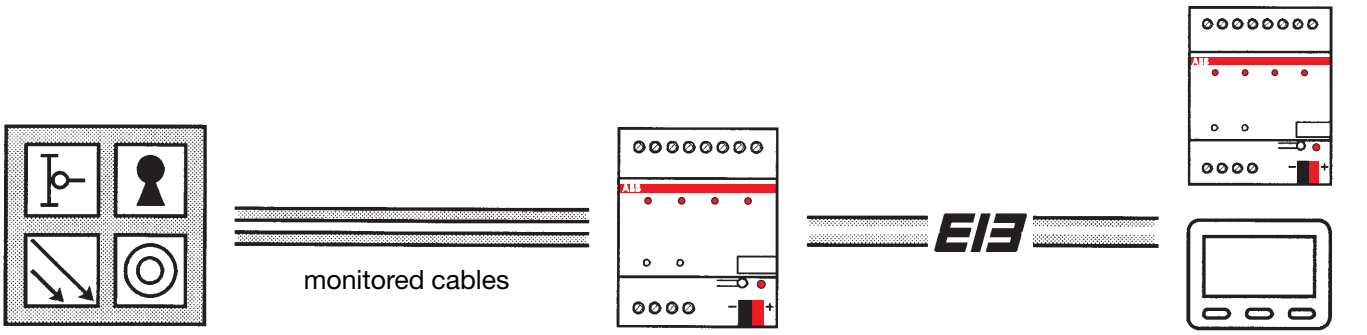
Contents

1 Device configuration

1.1 Introduction

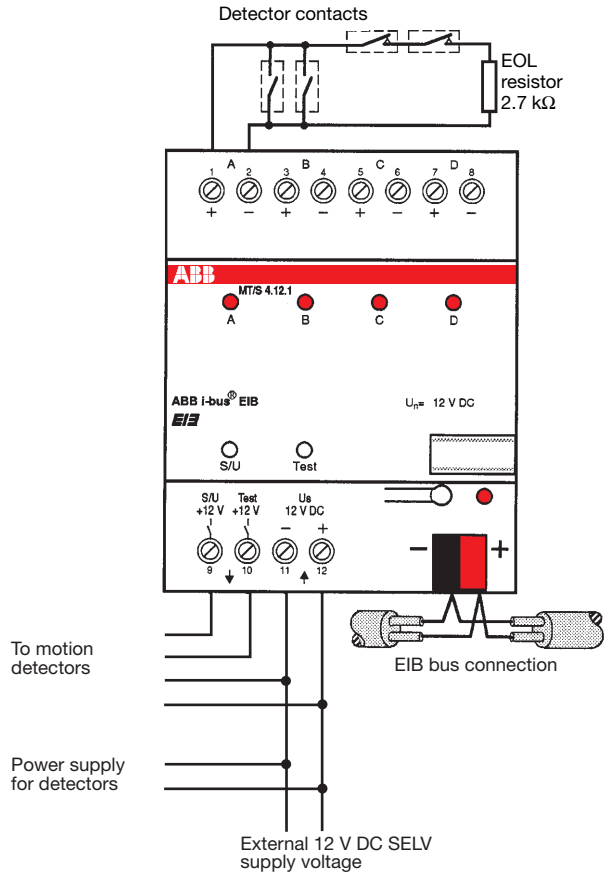
Zone Terminal MT/S 4.12.1

The zone terminal forms the interface between security sensors and the EIB. It is used for the connection of passive detectors (e.g. magnetic reed-contacts and/or glass-breakage sensors) to the ABB i-bus® EIB and/or to connect potential free contacts in applications with increased security requirements.



Security sensors | Zone terminal | EIB components

1.2 Wiring diagram



EOL = End of Line

1.3 Functional description of the display

When the device is unset, the current status of the zones is displayed via 4 LEDs. When the device is set, the LEDs are inactive. The current status of each zone is displayed again once the device is unset.

The 'S/U' LED displays the status of the zone terminal and the 'S/U' output. The 'Test' LED indicates the status of the 'Test' output.

1.4 Functional description of the inputs and outputs

- **Zone inputs** (terminals 1 to 8)

The device has 4 zone inputs (terminal pairs 1–2, 3–4, 5–6 and 7–8). The zones are designed to work with End of Line (EOL) resistors of 2.7 kΩ. To enable the zone terminal to function correctly, it is important to ensure that even unused zone inputs are terminated with a 2.7 kΩ resistor. This can be carried out directly at the input terminals.

For information about setting up zones and the selection of sensors, the brochure 'Application Notes: ABB i-bus® EIB Security and surveillance product range' is available.

- **'S/U' output** (terminal 9)

The voltage on this transistor output indicates the status of the zone terminal.

	Device set	**Device unset**
'S/U' output	12 V	0 V
'S/U' LED	OFF	ON

This signal voltage can be evaluated by specific detectors. It can be used, for example, by passive infrared detectors to activate the alarm storage function of the detector.

- **'Test' output** (terminal 10)

The 'Test' output is likewise a 12 V DC transistor signal output. The 'walk test' function of passive infrared detectors can be activated using this signal.

	Walk test OFF	**Walk test ON**
'Test' output	0 V	12 V
'Test' LED	OFF	ON

This output is controlled via the ETS parameter "Device status on return of bus", i.e. it is not possible to activate or deactivate the 'Test' output via a bus telegram.

- **Supply voltage inputs** (terminals 11 and 12)

The required 12 V DC SELV supply voltage is connected to these terminals (terminal 11: 0 V, terminal 12: + 12 V DC). Terminal 11 is also used as the common reference potential for the two outputs 'S/U' and 'Test'.

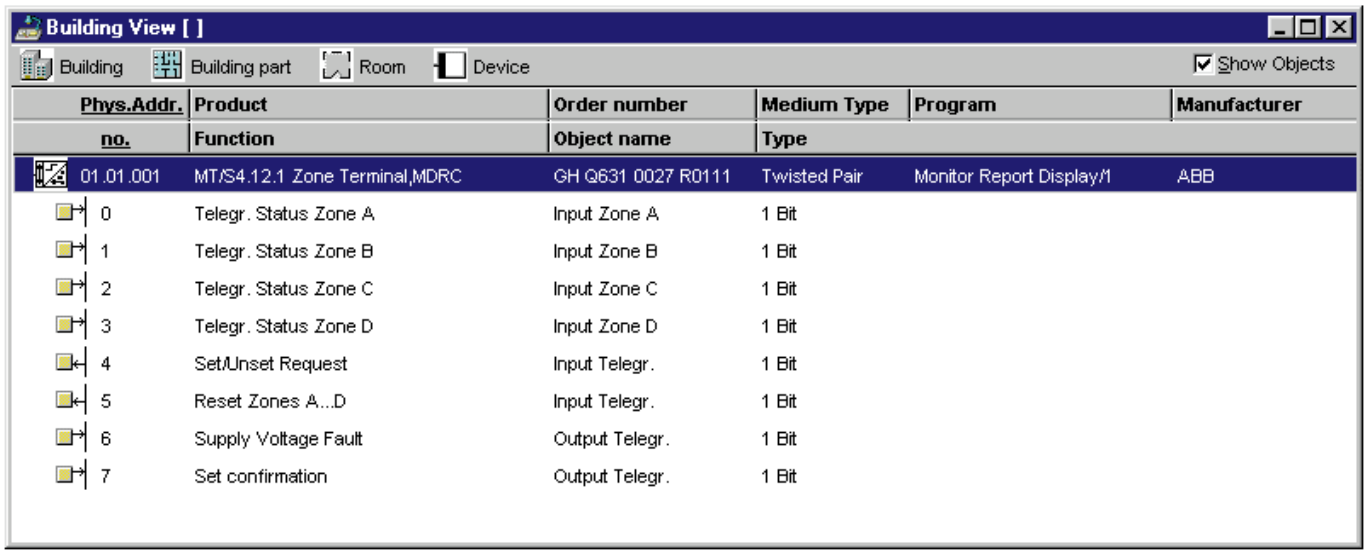
2 Application software

2.1 Description

The application software “Monitor Report Display / 1” makes it possible to implement security and surveillance functions using the EIB.

2.2 Communication objects

The application software has eight 1 bit communication objects: two ‘input objects’ for receiving input telegrams and six ‘output objects’. Only one group address can be assigned to each communication object.



Phys.Addr. / no.	Product / Function	Order number / Object name	Medium Type / Type	Program	Manufacturer
01.01.001	MT/S4.12.1 Zone Terminal,MDRC	GH Q631 0027 R0111	Twisted Pair	Monitor Report Display/1	ABB
0	Telegr. Status Zone A	Input Zone A	1 Bit		
1	Telegr. Status Zone B	Input Zone B	1 Bit		
2	Telegr. Status Zone C	Input Zone C	1 Bit		
3	Telegr. Status Zone D	Input Zone D	1 Bit		
4	Set/Unset Request	Input Telegr.	1 Bit		
5	Reset Zones A...D	Input Telegr.	1 Bit		
6	Supply Voltage Fault	Output Telegr.	1 Bit		
7	Set confirmation	Output Telegr.	1 Bit		

2.3 Zones A, B, C and D

Each zone has a separate 1 bit communication object that sends the status of the zone onto the EIB bus.

	Telegram value ‘0’	Telegram value ‘1’
Status of the zone	OK	Fault

The mode of operation of these communication objects depends on the status of the zone terminal and the preceding events.

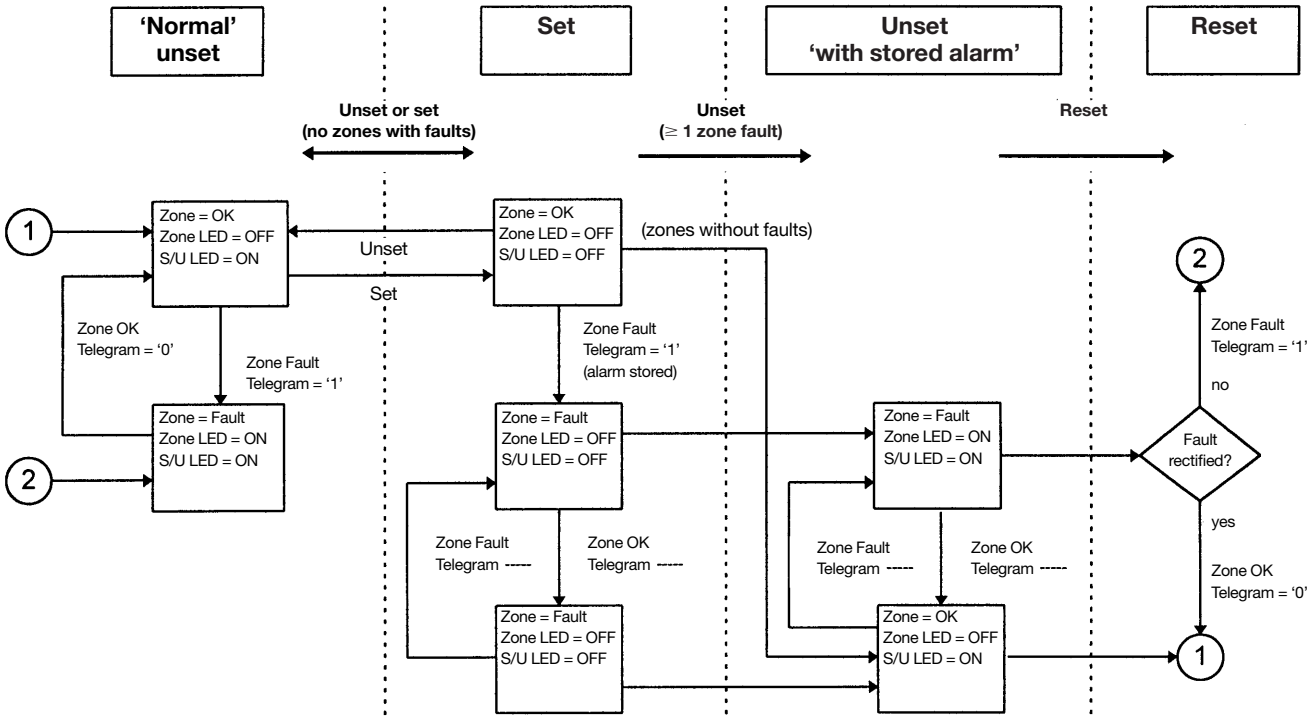
- **Unset**: In the ‘normal’ unset mode, i.e. after a ‘reset’, the zone terminal sends a corresponding telegram each time there is a change in the status of the individual zones.

- **Set**: When the device is set, a telegram is sent once if a zone has a fault.

- **Unset with stored alarm**: If after the device has been unset, an alarm has been stored in one of more zones, no further telegrams are sent from the zones. The device only returns to the ‘normal’ unset mode after a ‘reset’.

If no alarm is stored, once the zone terminal has been unset, the device reverts automatically to the 'normal' unset mode.

The following flow diagram represents the outlined functions:



2.4 Set/Unset Request

With this communication object, it is possible to set or unset the zone terminal. When set, the LED display is switched off and the alarm storage function of the zone terminal is activated. The device can only be set if no faults are present.

	Telegram value '0'	Telegram value '1'	
Device unset	Device signals it is unset	no fault[1]	Device is set
		Fault[1]	Device remains unset[2]
Device set	Device is unset	no function	

[1] Fault: One or more zones have faults and/or there is a fault in the 12 V DC supply voltage.
[2] Device signals it is unset: The signal is made via the communication object "Set confirmation".

2.5 Reset Zones A…D

This communication object enables the zone terminal and its zones to be reset after:

- a fault in the zones while the device was set
- a fault in the supply voltage (= sabotage).

A 'reset' can only be carried out when the device is unset. Telegrams are only sent by the zones whose status has changed during the 'reset' or by zones where there is still a fault after the 'reset'.

	Telegram value '0'	**Telegram value '1'**
Device unset	no function	Device is reset
Device set	no function	no function

2.6 Supply Voltage Fault

The status of the 12 V DC supply voltage is indicated using this communication object.

- **Cyclical sending**: Via the parameter window, it is possible to select that this communication object sends telegrams cyclically for bus monitoring purposes. With this setting, the value '0' is continuously sent until a fault is detected. There after the value '1' is sent, regardless of whether the fault is still present or not.

- **No cyclical sending**: If a fault occurs, a telegram (value '1') is sent only once. The communication object is then disabled.

In both cases, it is only possible to reset the fault indication by rectifying the fault and carrying out a 'reset' of the zone terminal.

	Telegram value '0'	**Telegram value '1'**
Status of the supply voltage	OK	Fault

2.7 Set confirmation

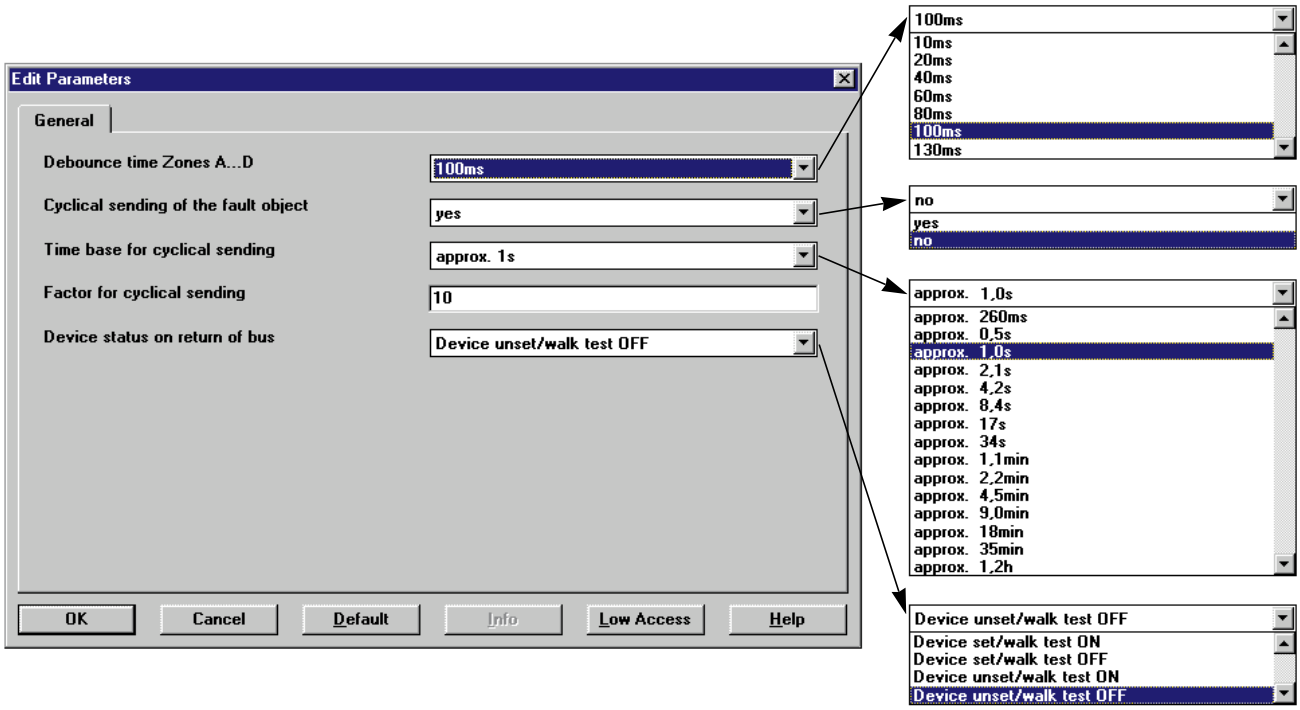
This enables the status of the zone terminal to be relayed back to the EIB bus. A telegram is only sent if:

- the status of the zone terminal has been changed by a set or unset command
- a set command could not be carried out successfully due to a fault

	Telegram value '0'	**Telegram value '1'**
Status of the zone terminal	unset	set

3 Parameters

The following parameter window is displayed in the ETS program:



3.1 Debounce time

With the parameter “Debounce time”, the bouncing of the detector contacts can be intercepted at the four zone inputs and unnecessary telegrams are blocked. A possible false alarm can thus be avoided

3.2 Cyclical sending

Via the parameter window, the function “Cyclical sending of the fault object” can be activated or deactivated. The transmission interval is indicated in the parameters “Time base for cyclical sending” and “Factor for cyclical sending”. The time is the result of the product of the set values:
transmission time = base for cyclical sending x factor for cyclical sending.
It is recommended that a low base and the highest possible factor are given so that the set time is kept to as accurately as possible.

Note: For security applications in which the EIB bus is to be monitored for interruptions, a transmission time of 10 s is recommended. (According to VdS guidelines, on recognition of an alarm signal, a warning must follow within 10 s).

3.3 Device status on return of bus

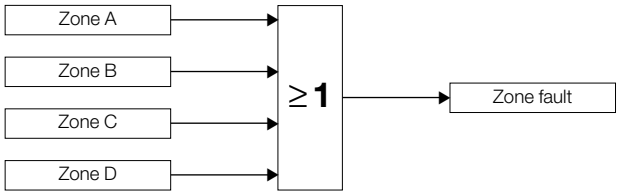
After a bus voltage failure, it is possible to specify in this parameter the status of the zone terminal when the bus voltage is restored. The status of the zone terminal before the bus failure is not stored which means that earlier alarm signals are lost.

- Device – set or unset
- ‘Walk test’ – ON or OFF

4 Examples of application

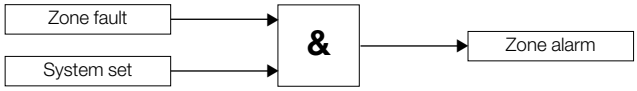
4.1 Zone fault

In a typical installation, the individual faults of the zones should lead to a centralised alarm. This function can be implemented using a logic gate.



4.2 Alarm devices

Local alarm devices, i.e. external sirens and/or flashing lights and silent alarm devices, e.g. telephone dialling systems should normally only be activated when the system is set. The following logic function only sends an alarm telegram if the system is set and there is a zone fault.

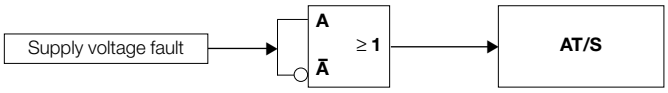


The telegram “System set” is controlled directly by the communication object ‘Set confirmation’.

4.3 EIB bus monitoring

If the communication object ‘Supply Voltage Fault’ is set to cyclical sending, the transmitted telegrams can be used simultaneously for the monitoring of the supply voltage as well as for bus monitoring purposes (i.e. interruption of the bus).

The status of the 12 V supply is given by the value of the transmitted telegram ‘Supply Voltage Fault’. The logic function shown below converts any telegram received (value ‘0’ or ‘1’) into a telegram with value ‘1’.



Should a telegram not arrive within a specified transmission interval, e.g. due to an interruption of the bus (= sabotage), an alarm signal can be implemented, e.g. together with a binary output (application software ‘autoreset’).

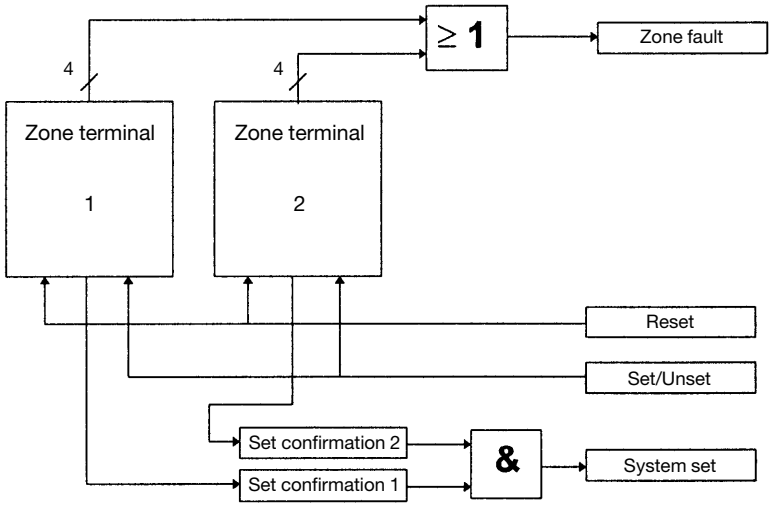
4.4 Parallel connection of zone terminals

In installations in which more than 4 zones are needed, it is possible to connect zone terminals in parallel. In this case additional logic functions are required.

Important: If zone terminals are connected in parallel, the installation functions slightly differently to an individual device. This affects the behaviour of the devices during fault storage.

If a device detects a fault while it is set, no further telegrams are sent once it has been unset. In comparison, the other devices in the installation which have not detected a fault all revert back to the 'normal' unset mode once they have been unset. Telegrams are sent out as normal should there be a fault in a zone. This means that the storage of alarms can be invalidated under certain conditions if, for example, it is not possible to distinguish between current and stored alarm signals.

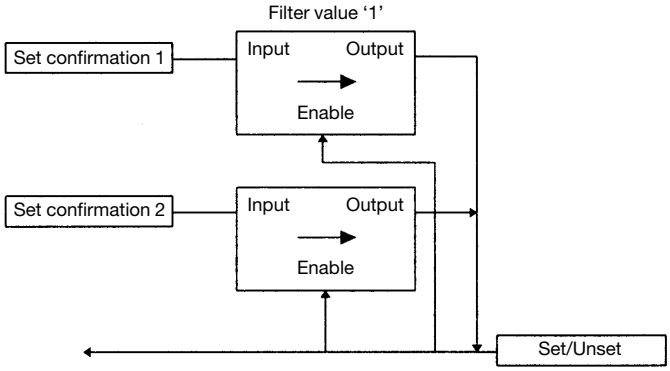
The following diagram represents the connection of two zone terminals.



The telegram 'System set' is produced by a logical AND connection of all 'Set confirmations'.

If no 'System set' telegram is received after an attempt to set the system, i.e. no telegram with the value '1' has been sent, this means that at least one device has a fault. The other devices are set however.

In order to give the whole installation a defined status, a manual unset telegram must be sent. This can however also be done automatically using the following additional logic function (application software – Filter Switch / 1).



In order to activate the system, a telegram 'set/unset' with the value '1' is sent as usual. The value '1' also allows the filter gates to be enabled which have been programmed so that they only allow the value '0' to pass through. Once the set telegram has been received, the zone terminals report back either with the value '1' (set) or '0' (unset).
Should all the zone terminals report back with the value '1', the filter gate outputs remain inactive. The whole system is now set.
Should a zone terminal report back with the value '0', the telegram that is received at the filter gate input is allowed to pass through and is routed into the system as an unset telegram. All the zone terminals are thus immediately unset again.

4.4 General notes

If more than two zone terminals are connected in parallel, the design of the external control logic function can be complicated. The increase in telegram interchange must therefore be considered as this can quickly lead to overloading of the bus and possibly to malfunctions.

If several logic modules are used to implement the external logic function, it is recommended that time delay parameters are assigned to the output telegrams (if available in the application software). This prevents

- telegrams from being sent before all the telegrams have been received and evaluated at the input
- all the logic gates from simultaneously attempting to send telegrams and thus overloading the bus.

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