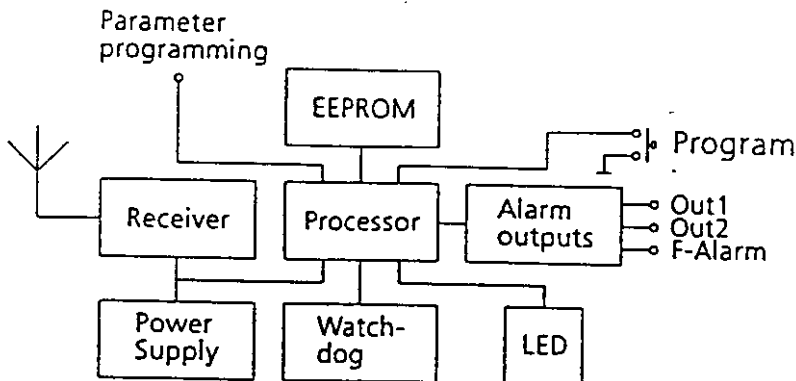


U981 miniALARM receiver Circuit-/Function description Programming and Installation

General



U981 is a small alarm-receiver used either together with the miniALARM transmitter U971 or in a telePROTECT 900 alarm system. Alarms are received, decoded and indicated via three separate alarm outputs. The first output is activated for test alarms and the second for alarms from the transmitter. The third output, function alarm, is activated when an error is detected in receiver or transmitter function. The U981 can also be programmed to respond to pagings from the teleCOURIER 900 paging system.

Alarms are received in the 425 - 475 MHz UHF range. The code format is fully compatible with the teleCOURIER 900 paging system and telePROTECT 900 system.

The receiver can be installed using either flush-mounting or surface-mounting techniques.

The actual function of the receiver is determined by parameters. These parameters are stored in an EEPROM.

Block description

refer to drawings 10594 and 10598

Power supply

The power supply circuit is located on the output module (drawing 10598). The supply (AC or DC) is connected to terminal J002. The supply-voltage is fed via an ESD-protection circuit to a rectifier D001. A voltage regulator consisting of TR001, R003 and Z001, limits the supply-voltage to maximum 15V before connecting it to the receiver module via J001.

Processor section

IC101 is a mask-programmed microprocessor. It decodes the received alarms/pagings and handles timing for the alarm outputs and battery saving. The processor is connected to an EEPROM (IC102) and a Watch-dog.

Parameters determining the function of the receiver are stored in the EEPROM.

A Watch-dog is used to check the function of the processor. Normally P30 (pin25) of the processor toggles approximately once every second to reset the Watch-dog. This signal is converted into a short pulse by C135 and fed to TR102. TR102 charges capacitor C137 for each negative pulse. The capacitor is discharged by voltage detector VR104. If an error causes the processor "loop" or "hang" the reset pulses will be interrupted. Capacitor C138 will then continue to discharge until VR104

trips. When VR104 trips it will, via D100B, pull the reset-pin of the processor low thus restarting it. The same signal will, via D100A and TR101 charge C137 again releasing the reset to the processor. To ensure a proper start-up for the processor when applying supply voltage, a voltage detector VR103 senses this voltage. The output of VR103 is held low until the voltage reaches approximately 5V thus keeping the processor resetted until a stable supply-voltage is established.

Pin 13 of the processor is connected to LED1. Via this LED the function of the processor is indicated.

By pushing SW1 on the output module pin32 on the processor is pulled low. The processor now, if allowed in the parameters, enters the user program mode. In this mode it is possible to program the identity of an alarm transmitter into the U981 by sending an alarm to it.

On pin23, 24 and 25 of the processor the alarm type-part of the function byte appears. This is not used in U981 at present.

Via pin25 and 32 the processor communicates with the programmer. The programmer also supplies power to the receiver during programming.

The receiver-part is switched on by the processor putting a logic high level on pin44.

Receiver section

The receiver is of single conversion super heterodyne type with an intermediate frequency of 455kHz. The UHF signal is picked up by the antenna and amplified in the two front-end amplifiers built round transistors TR300 and TR301. The amplified UHF-signal is then fed to the mixer-transistor TR303. In this transistor the UHF-signal is mixed with the local oscillator-signal.

Local oscillator frequency is determined by the crystal X300. The frequency of the oscillation is doubled in IC100F and tripled in the circuit built round TR302.

The signal from the mixer is buffered in IC100D before fed to the ceramic filter FL301. The filtered signal is then fed to the limiter/detector.

In the limiter the signal is amplified and limited to eliminate all AM komponents in the signal. The signal is FM-detected in the Quadrature detector built round L102.

The LF signal from the detector is filtered in IC100H and then fed to a limiting amplifier IC100I. IC100I provides a digital signal to the processor pin 29.

To compensate for frequency differences between transmitter and receiver an automatic frequency control (AFC) is provided. The DC voltage of the detector is compared to a fixed voltage in IC100G. The difference between these two voltages is then fed to D300 which pulls the frequency of the crystal.

Output section

When an alarm or error occurs this is signalled on the processor-pins 1, 2 or 3. These alarm-signals are, via J001, fed to the output module.

On the output module the alarm-signals are fed to optocouplers IC001, IC002 and IC003 and then to J003.

Function description

The actual function of the receiver is determined by parameters. These parameters are stored in an EEPROM. This description will summarise the function for different parameter settings. The parameters are described in the order they appear when programming. Programming is done using MHB-5 and a T981PA as programming adapter.

General function

Alarms or pagings are received, decoded and indicated on two separate outputs: Output 1 and Output 2. On the third output, Function-alarm, errors are indicated. Transmitter errors are indicated by activation of the Function-alarm together with one of the other outputs. Checksum error in receiver parameters is indicated by a slow toggling, on and off, by the function-alarm output

The LED function-indicator shows the mode of operation as follows:

No light	Power supply not connected, to low voltage or Watchdog triggered
Steady light	Normal operation of receiver with no battery save.
Short flashes -long period	Normal operation of receiver with battery save.
Short flashes -short period	User program mode
Fast flashing	Alarm/paging received or user address programmed/cleared

Upp to sitem alarm transmitter identities can be programmed via radio. this is done as desc

Address ranges

Two address ranges are provided. Hexadecimal digits from "1" to "E" is allowed as address digits. The digit "F" is equal to not programmed. The "wild-card" digit "E" is not allowed in alarm systems but must be programmed in the address range if "wild-card" is used in a paging system.

Receiver type

The receiver can respond to either alarms or paging.

When set to paging the receiver will distinguish between different bleep-types as follows:

- Silence: Both outputs off
- 1 Bleep: Output 1 on
- 2 Bleep: Output 1 toggles on/off every second
- 3 Bleep: Output 1 off
- 4 Bleep: Output 2 on
- 5 Bleep: Output 1 toggles on/off every second
- 10 Bleep: Output 2 off
- Siren: Both outputs on

When this parameter is set to alarm normally test-alarms will activate output 1 and all other alarm types output 2, To allow full compatibility with the teleprotect U970 transmitter, alarm type "ALARM1" can be connected to output 1 instead of output 2 as described below.

Outputs will be in the on-state for the ACTIVATION TIME as described below.

User program function

The receiver can be programmed to allow a maximum of 16 alarm-transmitters to be programmed via radio. User programming is done as follows:

Programming

- 1 Press and release the programming button on the output module. The LED on the receiver module will start to flash slowly to indicate user program mode.
- 2 Initiate an alarm from the transmitter. The LED will flash rapidly for a short time to indicate a successful programming. If the rapid flashing does not occur, the transmitter was already programmed, user memory is full or the programming was not successful. *Always make a test-alarm after programming a transmitter to make sure the programming is OK*

Erasing

- 1 Press and release the programming button on the output module. The LED on the receiver module will start to flash slowly to indicate user program mode.
- 2 Press the programming button once again and keep it pressed until a rapid flashing starts. This will take about two seconds. All user programmed identities are now erased.

User programming is only possible for an alarm-receiver!

Battery saving

To reduce current consumption it is possible to battery save the alarm-receiver. Battery -saving is only possible together with the U971-transmitter. Note that, when used as a paging receiver battery-saving is not possible! The LED indicator will flash once every battery-save period.

Teleprotect compatibility

To allow full compatibility with the teleprotect transmitter U970, it is possible to redirect the alarm type ALARM1 to output 1, which normally is the test-alarm output.

Locator Code

The alarm-receiver can be programmed to respond to locator-code from an teleprotect U970-transmitter. One locator-code range can be programmed. Locator code can not be programmed in user program mode.

Lockout function

It is possible to detect if a unexpected high rate of not programmed identities are received. If a selectable (1 to 15) number of not programmed identities are received during one minute the function-alarm output will be activated and the decoder will lock up for the next one minute.

Outputs at alarm

The receiver can be programmed to close or open the outputs when they are activated. This is programmed for all tree outputs together.

SET-/RESET-mode

When this parameter is set to on, all alarms to output 1 will set output 1 and reset output 2. All alarms to output 2 will set output 2 and reset output 1.

a paging with tree or less bleeps, will set output 1 and reset output 2. Pagings with four or more bleeps, including alarm, will set output 2 and reset output 1.

At power up output 1 will be set and output 2 will be resetted.

The activation time, as described below, is only valid for the LED indication in this mode.

Dead time

During this time it is not possible for the same alarm-identity or paging address to reactivate the outputs. This is used to avoid reactivation of the outputs due to code-repetitions from the transmitter. The time can be set from 0 to 30 in steps of two seconds.

Activation time

This is the time the outputs are active after an alarm or a paging. This time can be chosen between 0.5 to 30 seconds. If a of the outputs occur, a new activation period is started. The activation time is common for all tree outputs thus if one output is reactivated, the activation of all others are also proionged.

For a receiver programmed for pagings, it is possible to make the activation time infinite by setting it to maximum (30 seconds). In this case the output state can only be changed by a new paging.

Programming

When programming receiver parameters a T981PA programming adapter is used together with an MHB-5. The programming adapter converts all voltage levels between the programmer and U981. MHB-5 is a universal programmer used for both teleCOURIER- and telePROTECT equipment. The programming adapter is also used when tuning the receiver. It is therefore also supplied with a test antenna. During programming power is supplied from the MHB-5. Thus do not connect T981PA to an external power supply when programming parameters!

Put the receiver in the T981PA programming adapter and connect adapter to MHB-5. Make sure external power-supply is not connected to T981PA.

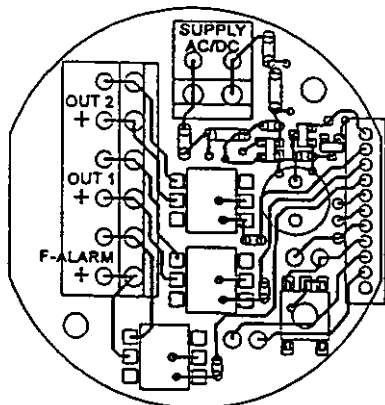
Chose "telePROTECT 900" and "miniALARM RX 981" from the main menus of the MHB-5. The display will now show the telePROTECT 981-menu. The programming is then done as follows:

- 1: Press "SET DEFAULT PARAM." to load a default parameter set-up.
- 2 If existing parameters are to be changed the receiver parameters can be loaded into the MHB-5 by pressing the READ-button under the "PROGRAM/READ/VERIFY"-sub menu.
- 3 Receiver parameters can now be changed under the "CHANGE PARAMETERS" -sub menu.
- 4 Edit parameters according to desired function as described under function description above.
- 5 Program parameters either using the "Program" button appearing when identity1 is shown in the "CHANGE PARAMETERS" -sub menu or by selecting the "PROGRAM/READ/VERIFY"-sub menu.

The receiver is now programmed. Please check the function before installing.

Installation

Refer to fig below for connector-pin name.



Output module

Connect alarm outputs. OUT 1 is activated for single press and OUT 2 for double press alarm. The F-ALARM output is activated if an error occurs in transmitter or receiver. The outputs are polarised. The positive terminal of each output is indicated by a "+".

Alarm outputs from several receivers may be connected in series but a voltage drop, depending of current, of up to 1 volt for each output must be accepted.

Maximum current from each output is 100mA.

Connect power supply to receiver. Supply voltage should be between 7 and 24 V AC or DC. Current consumption will be less than 4mA below 15 V and less than 15mA over 15V for a receiver with

ascom Tateco Telecommunications Systems

U981 miniALARM receiver

REC ID: BXZU981

921216RH

TD90XXXGB

battery-saving disabled. If outputs are programmed to be opened at alarm, an additional 12mA should be added to the above currents.

Program, if applicable, the desired transmitter addresses as described above.

Check the installation by sending alarms and make sure the expected coverage is achieved.

This completes the installation.

FCC Information

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

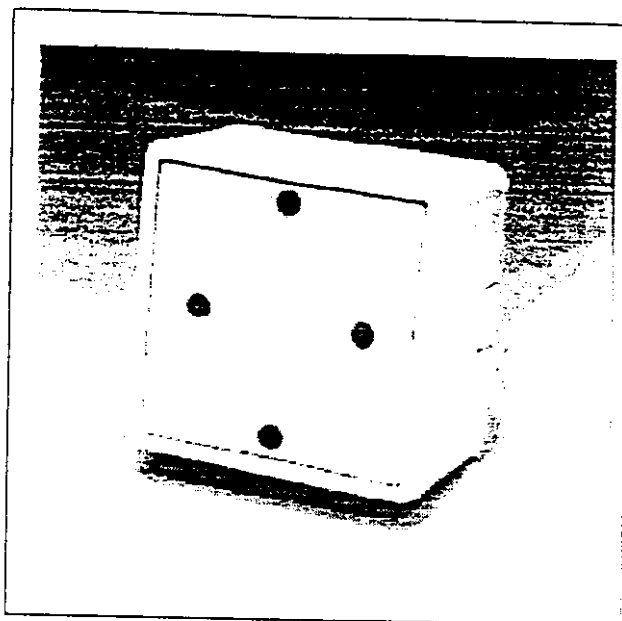
Warning:

Any modifications made to this device, not expressly approved by Ascom Tateco AB, could void the user's authority to operate this equipment.

Alarm Receiver U981

Features

- Small size
- 16 user-programmable transmitter addresses
- Low power consumption
- Extremely low power consumption in battery saving mode
- Continuous self-check function
- Flush or surface-mounting
- Can be used as wireless output module
- Easy to install



General

U981 is a small UHF alarm receiver used together with the U971 alarm transmitter as a separate alarm system, or in an ordinary telePROTECT 900 alarm system.

The alarm receiver can also be an integrated part in a teleCOURIER 900 paging system and the code format is fully compatible.

Applications and Operation

Alarms are received, decoded and indicated via three separate alarm outputs. The first output is activated for testalarms and the second for alarms from the transmitter. The third output, function alarm, is activated when an error is detected in receiver or transmitter function.

Both activation time and NC/NO function for the outputs are programmed in an internal EEPROM. Two address intervals for transmitters can be programmed and the unit can be programmed to respond to location code from the U970I transmitters.

A special user program mode allows a maximum of 16 transmitters to be programmed via the radio channel. This is done by entering the program mode and sending an alarm from the alarm transmitter.

U981 can also be programmed to respond to pagings from the teleCOURIER 900 paging system.

A battery saving option allows the U981 to be used in applications where minimal power consumption is vital. This option is only possible when used together with the alarm transmitter U971.

Maximum range for the receiver is about 100 meters at line of sight when used together with the alarm transmitter U971, and 400 meters when used with a U970/U970I transmitter.

The receiver can be installed using either surface mounting or flush mounting (recessed) techniques.

Technical Specifications

Dimensions:

Cover: 80 x 80 x 48 mm
Circuit board: Ø 52 x 30 mm

Weight: 125 g

Case: Polyamide acryl (PMMA) plastic, white and grey

Operating temp. range: -10 to +55°C

Supply voltage: 7 to 24 Vac or dc

Current consumption: The following data is valid for supply voltages below 10 Vac and 15 Vdc.
Normal mode: 6 mA or
20 mA max with all outputs active

Battery saving mode: 50 µA (mean value) or
20 mA max with all outputs active

Frequency range: 425-475 MHz

FSK/FM modulation: 3,0 kHz deviation at 25 and 20 kHz channel spacing
1,5 kHz deviation at 12,5 kHz channel spacing

Antenna: Integral

Spurious emissions: < 2 nW up to 1 GHz
< 20 n W over 1 Ghz

Alarm outputs:

Max load: Photocoupler 100 mA
Isolation: 5 kV rms

EMC, checked
according to:

IEC 801 - 2 1991
IEC 801 - 4 1988
IEC 801 - 5 1991

Accessories

Power supply

Specifications are subject to change without notice.

