
# Universal Time Relay
# Type NT 10

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The product offering covers a wide spectrum of technologies across the entire voltage range including indoor and outdoor circuit breakers, air and gas insulated switchgear, instrument transformers, disconnectors, capacitor banks and filters for reactive power compensation, power and distribution transformers and a range of power distribution products like Compact Secondary Substations (CSS) and Ring Main Units (RMU).

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- ✓ Unparalleled domain competence
- ✓ Vast global experience
- ✓ Total solution provider
- ✓ Large installed base
- ✓ Environment-friendly technologies

# Universal Time Relay NT 10

## Features

- Four user configurable operating modes
- Wide timing range with high accuracy
- Easy setting through DIP switches
- Hand reset 'Trip' LED indication
- Trip and signal duty contacts
- Micro-controller based design

## Application

The NT 10 relay is intended for use where high operating requirements are necessary, such as in protection relay systems, control equipment, industrial processes, and control and signal systems.

The multiple user selectable options provide flexibility to user, for use in various applications. The wide timing range, high accuracy and consistency of operation can replace any other time relays.

## Description

NT 10 with its micro-controller based design offers four modes of operation – ON delay, OFF delay, Flasher and Interval making it a true, universal time relay. The relay measures time when triggered by a control (binary) input. The control input has a single wide operating voltage range and is galvanically isolated. NT 10 is equipped with one heavy duty output relay with normally open contact and two change-over signal-output contacts.

The user friendly human-machine-interface (HMI) of relay with DIP switches, facilitates the selection of operating mode, time multipliers and time setting. For ease of use, the HMI is augmented with decoding matrix for DIP switch settings and dedicated LED's for status indication.

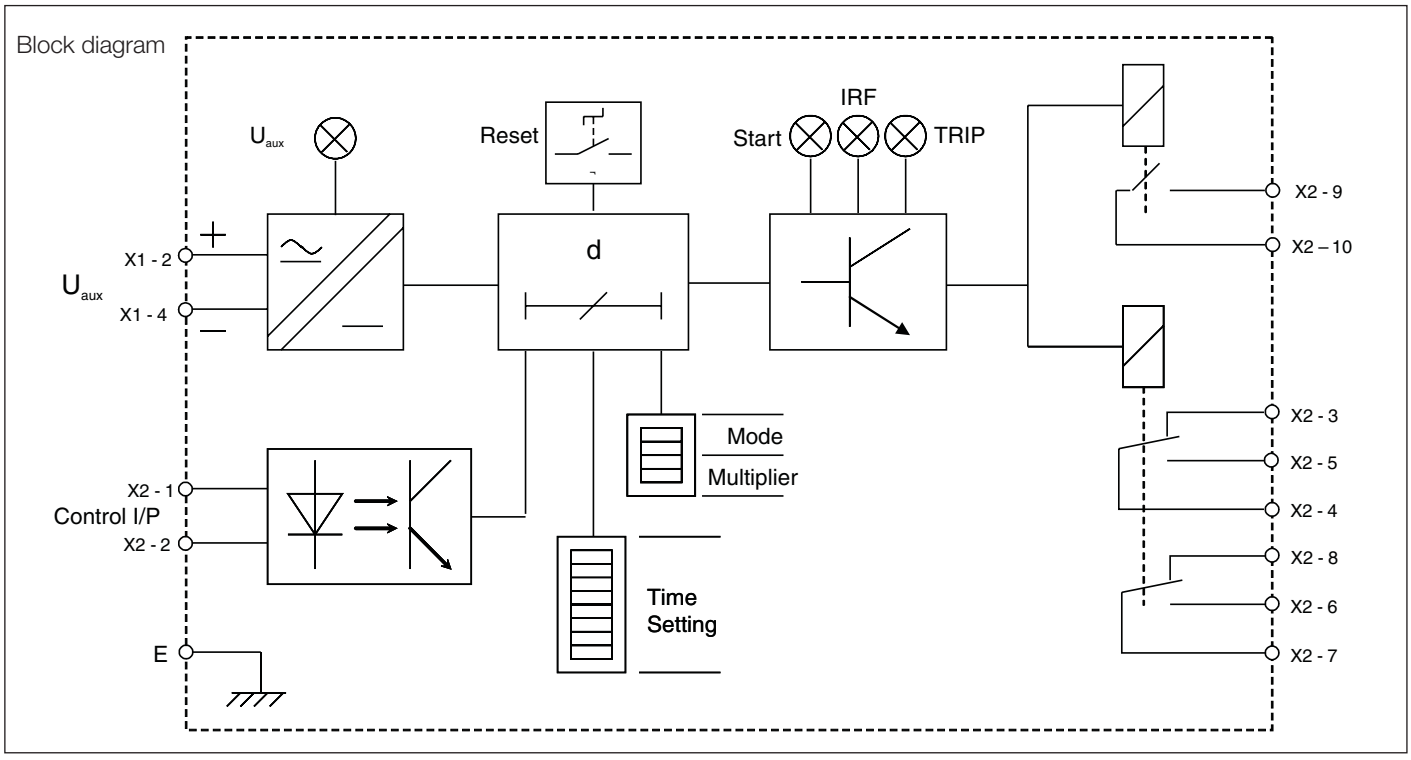
The '$U_{aux}$' LED lights-up when the relay is energized and indicates the presence of healthy internal power supply. The start of time measurement in ON/OFF delay modes or an active control input in Interval/Flasher modes is indicated by the 'Start' LED. When the mode setting is changed, relay ignores the control input and indicates an alarm to the user with a blinking 'Start' LED. This alarm can be acknowledged with 'Reset' push-button and thereby the mode change is applied. Operation of the relay, after the set time delay, in ON/OFF delay modes is indicated by the 'Trip' LED. This indication is latched and can be hand-reset by the 'Reset' push-button. The 'Trip' LED follows operation of output contacts in Interval/Flasher modes.

NT 10 incorporates a switch-mode-power-supply (SMPS) for wide voltage range of operation and eliminates the need for traditional 'external resistor', while reducing the variants due to auxiliary power supply. The relay comes with only two ordering variants of auxiliary voltage, thus covering the entire spectrum of rated voltages.

NT 10 is armed with a built-in self supervision system based on a 'watch-dog' timer with an independent oscillator that continuously monitors the state of relay hardware and the operation of the relay software. Any fault or malfunction detected is used for alerting the operator by an 'IRF' LED.

To protect the relay from unauthorized access and to maintain the integrity of settings, the relay combines a transparent cover with a reset push-button facility. The plug-in socket-block design of terminals, supports ease of installation and maintenance. The NT10 is suitable for flush mounting on panel and is sufficiently protected against any ingress. A unique wireless assembly and sheet metal case makes the relay robust and light weight.

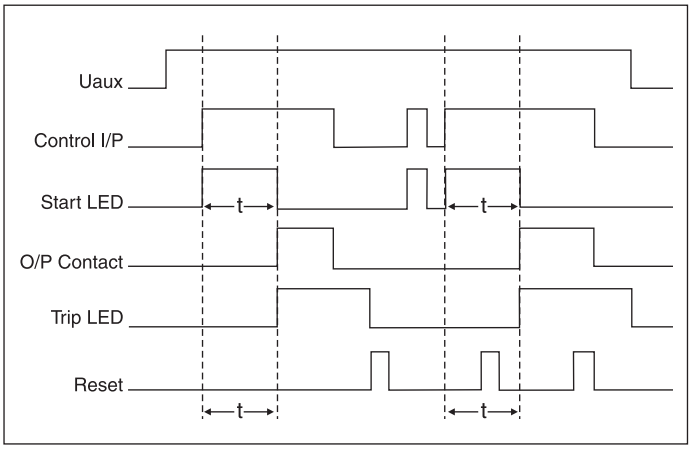
Block diagram



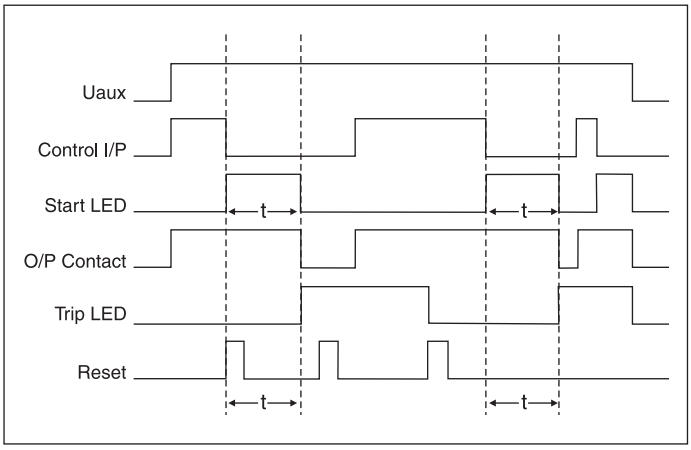
# Operational modes

The following modes are possible when the relay is energized with auxiliary supply.

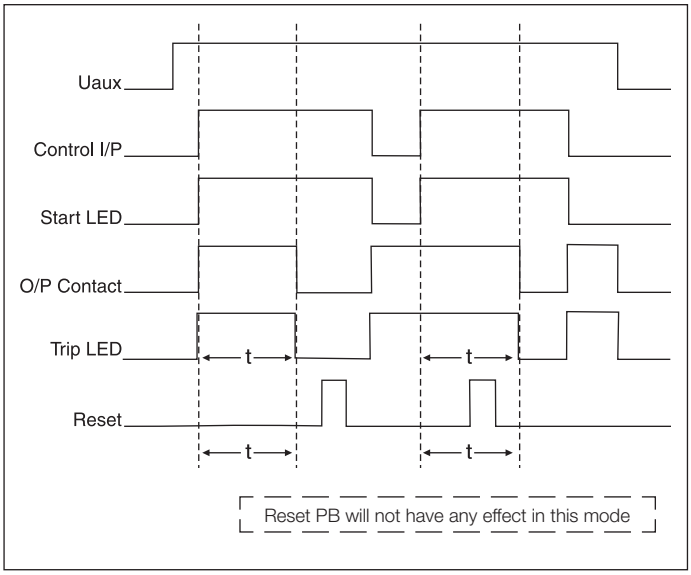
**ON Delay:** In this mode, the timing starts when the control input is applied and after the set time has elapsed, the delayed output switches to the operate condition.



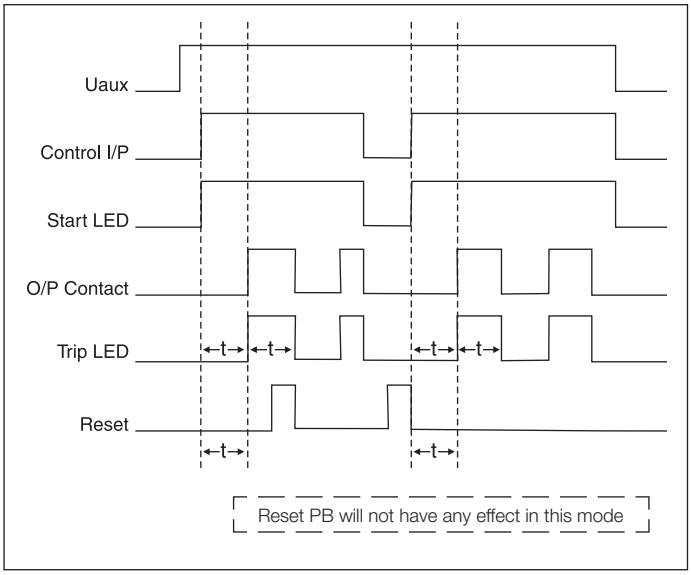

**OFF Delay:** In this mode, the output immediately switches to operate condition when applying the control input and in which the timing starts when the control input is disconnected and the output switches to released condition after set time has elapsed.




**Interval:** In this condition, the relay switches the output to operate condition for set time when the control input is applied or removed.




**Flasher:** In this mode, the output periodically switches on and off with substantially identical pulse on time and pulse off time as long as the control input is applied.



# Technical data

## General

### Energizing quantities, rated values and limits

| | |
|---|---|
| Rated auxiliary voltage Un (X1/ 2-4) | 18 - 80V dc, 80 - 265V ac/dc |
| Control input (X2/ 1-2) | 18 - 265V ac/dc |
| Rated frequency | 50Hz |
| Power consumption, Uaux | |
| Before operation | < 3W |
| After operation | < 4W |
| Power consumption, Control input | < 0.6W |
| Rated ambient temperature | –10°C to 55°C |
| Weight | 1.1 Kg |
| Terminals | Suitable for 2.5 sq.mm flexible wire |

### Performance specification

| | |
|---|---|
| Setting, $\Sigma T_d$ | 0 … 165 |
| Time multiplier, k | 10ms / 100ms / 1s / 10s |
| Time delay range, $k*\Sigma T_d$ | 0.01- 1.65 sec, 0.1- 16.5sec, 1- 165 sec, 10- 1650 sec |
| | Note: Minimum operate time in ON delay mode is 10 ms and in OFF delay mode, it is 30 ms |
| Accuracy | |
| Operate time accuracy | ±1% of set value or ± 5ms, whichever is greater |
| Change in operate time at voltage change within rated range | ± 3ms |
| Change in operate time at temperature change within rated range | ± 3ms |

### Contact data:

#### Tripping contact

| | |
|---|---|
| Terminals | X2/ 9-10 |
| Rated voltage | 250 V dc / ac |
| Rated current | 5A |
| Make and carry for 0.5 s | 30A |
| Make and carry for 3.0 s | 10A |
| Breaking capacity for dc circuit with | |
| L/R ≤ 40 ms, at 48/110/220 V dc | 5A / 3A / 1A |
| Contact material | AgNi |

#### Signaling contacts

| | |
|---|---|
| Terminals | X2/ 3- 4- 5; X2/ 6- 7- 8 |
| Rated voltage | 250 V dc / ac |
| Rated current | 5A |
| Make and carry for 0.5 s | 10A |
| Make and carry for 3.0 s | 8A |
| Breaking capacity for dc circuit with | |
| L/R ≤ 40 ms, at 48/110/220 V dc | 1A/ 0.25A/ 0.15A |
| Contact material | AgNi |

| | |
|---|---|
| Electrical endurance | 10,000 operations, at 110V dc, 0.35A resistive, 360 operations/ hour |

# Technical data

## Insulation tests

| | |
|---|---|
| Dielectric test | According to IEC 60255-5 |
| Test voltage | 2 kV, 50 Hz, 1min |
| Impulse test | According to IEC 60255-5 |
| Test voltage | 5 kV, 1.2/50 µs, source energy 0.5 J |
| Insulation resistance test | According to IEC 60255-5 |
| Test voltage | >100M Ohm at 500V dc |

## Electromagnetic compatibility tests

| | |
|---|---|
| 1 MHz burst disturbance test | According to IEC 60255-22-1, class III |
| Common mode | 2.5 kV, 1 MHz, 400 pulses/sec |
| Differential mode | 1.0 kV, 1 MHz, 400 pulses/sec |
| Electrostatic discharge test | According to IEC 60255-22-2, class III |
| Contact discharge | 6 kV, 150 pF/ 330 ohm |
| Air discharge | 8 kV, 150 pF/ 330 ohm |
| Radiated electromagnetic field immunity test | According to IEC 60255-22-3, level 3 |
| Amplitude-modulated | 10 V/m (rms), f = 80...1000MHz |
| Pulse-modulated | 10 V/m (rms), f = 900MHz |
| Fast transient disturbance test | According to IEC 60255-22-4, level III |
| Power supply ports | 2 kV, 5/50 ns, 50 Ohm, class B |
| I/O ports | 2 kV, 5/50 ns, 50 Ohm, class B |
| Surge immunity test | According to IEC 60255-22-5, class III |
| Common mode | 2 kV, 1.2/50 µs, $R_s$ = 12Ω |
| Differential mode | 1 kV, 1.2/50 µs, $R_s$ = 2Ω |
| Immunity to conducted disturbances induced by radio frequency fields | According to IEC 60255-22-6, level 3 |
| Common mode | 10 V, f = 150 KHz...80 MHz |
| Conducted and radiated radio-frequency emission tests | According to IEC 60255-25 |
| Conducted emission | 150 kHz...30 MHz |
| Radiated emission | 30 MHz...1000 MHz |
| Power frequency magnetic field immunity test | According to IEC 61000-4-8 |
| Continuous | 100 A/m |
| Short duration | 300 A/m |
| Power supply tests | According to IEC 60255-11, 61000-4-11 |
| Interruption of dc voltage | 46 ms |
| Interruption of ac voltage | 46 ms |
| Ripple in dc voltage | 12% of dc value |

## Mechanical tests

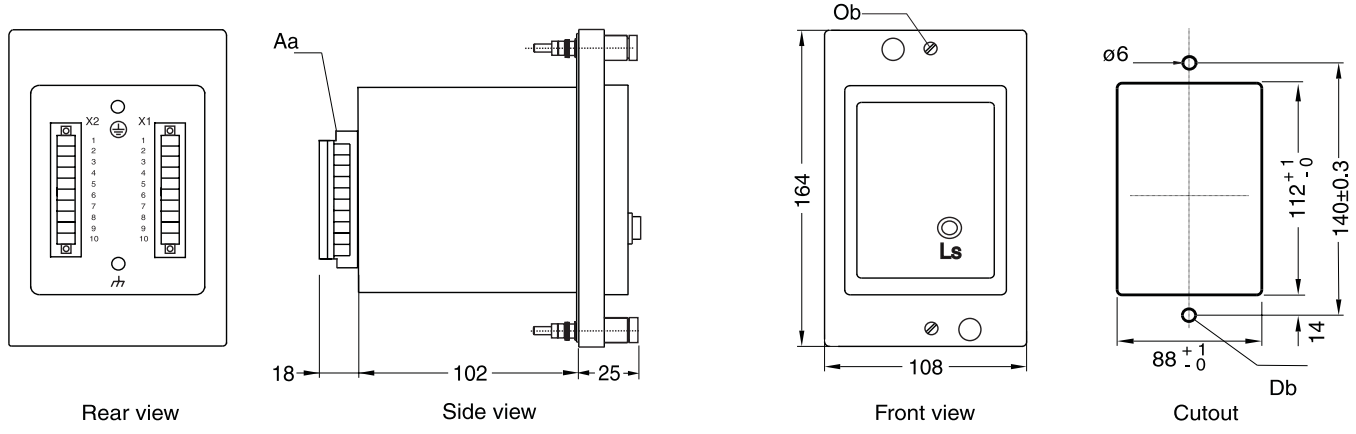
| | |
|---|---|
| Vibration test | According to IEC 60255-21-1, class I |
| Response | 10…150Hz, 0.5g |
| Endurance | 10…150Hz, 1.0g |
| Shock test | According to IEC 60255-21-2, class I |
| Response | 5g, 11ms |
| Withstand | 15g, 11ms |
| Bump test | According to IEC 60255-21-2, class I, 10g, 16ms, 1000 bumps/dir |
| Seismic test | According to IEC 60255-21-3, class I, 1...35 Hz, 0.5g |

# Technical data

## Environmental tests

| | |
|---|---|
| Degree of protection of flush-mounted relay | According to IEC 60529 |
| Front | IP 54 |
| Sides | IP 54 |
| Rear | IP 20 |
| Dry cold test | According to IEC 60068-2-1 |
| Test conditions | 16 h at - 10°C |
| | 4 h at -25°C |
| Dry heat test | According to IEC 60068-2-2 |
| Test conditions | 16 h at + 55°C |
| | 4 h at +70°C |
| Damp heat test, cyclic | According to IEC 60068-2-30 |
| Test conditions | 6 cycles at +25… 55°C |
| | Humidity 96… 98% |
| Transport & storage temp range | According to IEC 60068-2-48 |
| Test conditions | 72 h at -40°C |
| | 72 h at +70°C |

## Dimensions




Rear view

Side view

Front view

Cutout

1/2'S' case mounting.

Legend
Aa : Socket block
Db : Mounting hole
Ls : Reset button
Ob : Mounting screw

## Ordering details

| Relay Type | Contact | Rated Voltage | Article no. |
|---|---|---|---|
| NT 10 | 1 NO + 2 CO | 18 – 80V dc | 1MYN569701 – A |
| NT 10 | 1 NO + 2 CO | 80 – 265V ac/dc | 1MYN569701 – B |

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