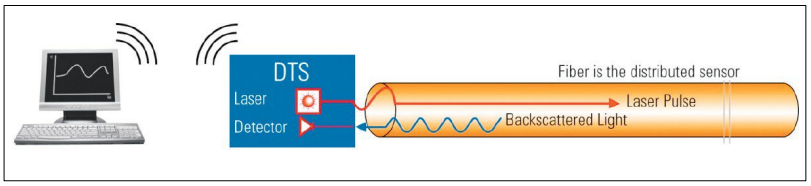
# LINEAR HEAT DETECTOR
# HONEYWELL DTS



**DTS (Distributed Temperature Sensing) System is capable of detecting fires and accurately localize fires and hotspots.**

The system allows to precisely measure, locate and signalize even small differences of temperature changes by measuring and highlighting temperature of a specific spot vs. environment.
Fire resistant (PH rating) sensing cable can transmit signals also during a fire, even when temperatures are up to 1000°C.
That allows to monitor the progress of fire and supervise fire rescue action accordingly. There is a wide range of possible applications to use a Linear Heat Detector DTS as shown in the table below.




Operating principle

| Application | DTS advantages |
|---|---|
| Tunnels, parking areas | DTS sensor cable resistant to exhaust fumes, dirt, moisture |
| Cable routes, channels | DTS sensor is able to localize and signal spots of overheating |
| Transformers, turbines, engines | DTS, fully EMC proof cable, able to measure temperature at threatened spots |
| Technical floor | DTS sensor cable is fully maintenance free, no service access needed |
| Mining / power plants / refineries | DTS solution certified: ATEX, VdS, SIL, UL for heavy- duty industrial applications, detecting fire/ leakage / frost / overheating |
| Biomass, grains, waste warehouses | DTS sensor cable resistant to heavy dust and acid environment |
| Belt conveyors | DTS detects and localizes worn down and overheated conveyor belt rollers |

## FEATURES AND BENEFITS

- Temperature measurement and monitoring by fiber-optic sensor cable
- Up to 16 km sensor cable for each measurement channel
- 1, 2 or 4 measurement channels per detector
- Loop or open line sensor cable topology
- Up to 2000 independent alarm zones per measurement channel
- Laser class 1M power below 20mW
- 1 seconds measurement cycles
- Sampling interval up to 0.25 m
- Relay interface, optionally Modbus IP
- Bidirectional, full digital integration with ESSER by Honeywell fire alarm systems
- EN 54 - 22:2015 + A1:2020 Compliance, Certificate

RVS
*Richtlinien und Vorschriften für das Straßenwesen

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## OPERATION PRINCIPLES

The DTS detector equipped with a low power laser source (laser class 1M) generates measurement impulses in a fiber-optic sensing cable FRNC and analyzes frequency spectrum of returning echo. Using Raman scattering (quantum physics effect) and patented measurement technique (Optical Reflectometer Code Correlation), DTS detector indicates temperature profile along up to 16 km sensor cables. Every 1-30 seconds the system determines temperature of thousands of measurement points deployed every 0.25-8 m along the sensor cable. Measurement results are statistic outcomes of many repeated measurements during the cycle. Low power laser operating with heavy-duty, industrial-proof sensor cable ensures over 20 years of system operation time. The precise measurement system allows long-standing operation without necessity of recalibration. 1M laser class ensures high level of safety. In case of sensor cable break, system is able to continue measurement without any risk to human life and is still also able to operate in hazardous environment with explosive gas, vapors or dust.

## DTS DETECTOR

Low power consumption (22 W) ensures operation inside rooms without air conditioning and long time operation on battery emergency power supply. After complete power supply loss, the detector automatically restarts itself and returns to normal operation within 30 seconds after powering on.

Both laser transmitter and receiver are thermally stabilized which ensures precise measurement over the entire operating temperature range. All optical elements are placed in air-tight containers filled with noble gas. This solution ensures protection against moisture and dust, and guarantees fault-free and long-lasting operation in heavy duty industrial environment.

DTS detector stores the most recent 120 temperature measurement traces along whole sensor cable length, which allows alarm events and system faults analysis.

## INTEGRATION WITH FIRE ALARM AND MANAGEMENT SYSTEMS

DTS detector can operate as a standalone system. In this case the system displays alarm states, faults, locations of cable break etc. using LED indicators and LCD display on detector housing. For monitoring in the fire alarm system, DTS detector provides 10 relay outputs, optionally upgradeable to 98 outputs. DTS outputs may transmit alarm and fault states from configured alarm zones to any fire alarm system. The safest functionality and highest performance is provided though by bidirectional, fully digital integration with ESSER by Honeywell IQ8Control and FlexES Control systems via SEI2 interface into essernet network. Digital integration makes possible[1)] the transmission of more than thousand zone alarms, prealarms, faults as well as disablement, test mode and reset of individual zones. Moreover to obtain best operator interface it is recommended additionally to integrate DTS directly via Ethernet network with a management software.

## CONFIGURATION OPTIONS

The DTS detector can be equipped with 1, 2 or 4 measurement channels. It allows operation with 4 open lines or 2 loops sensor cable topology. Each channel can be configured with up to 2000 alarm zones with maximum 5 individual alarm criteria for each alarm:

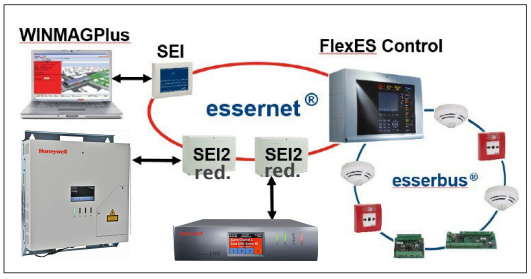
- exceeded temperature level (constant temperature threshold)
- exceeded local temperature level in regard to average temperature measured in a zone (adaptive temperature threshold)
- 3 criteria of exceeded temperature increase within certain time
- exceeded low temperature level (frost alarm)
- localization and indication of a sensor cable break (LCD display or visualization software)

Loop sensor cable topology provides redundancy of the cable – all system functions (especially temperature measurement) are preserved along the entire length of the sensor cable despite sensor cable break.

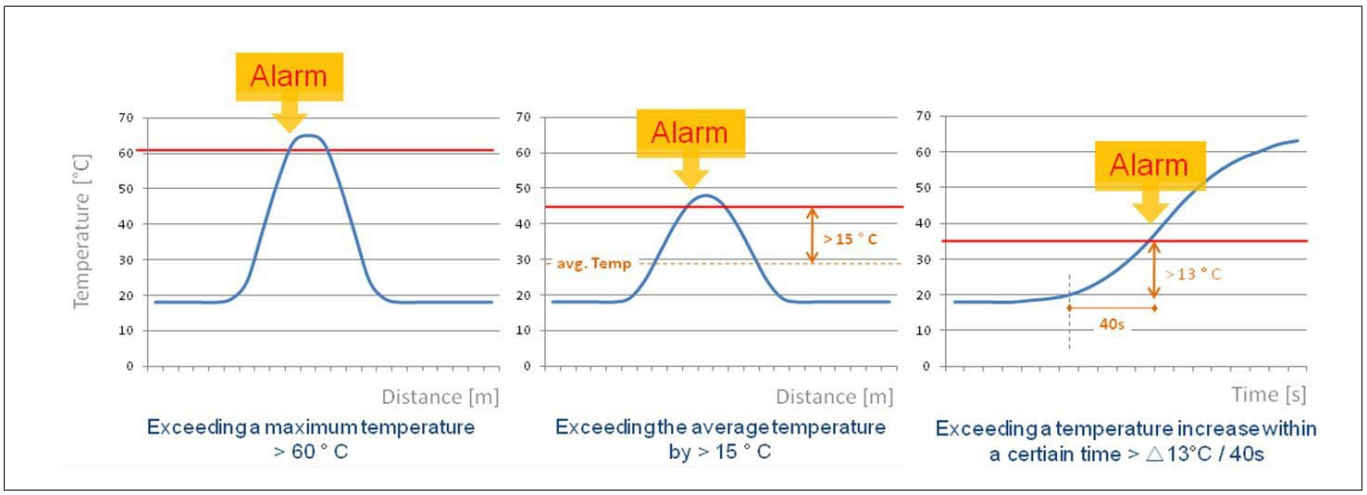
Two sensor cable types are available:

- Safety FRNC – standard without metal components
- Steel FRNC – armored with stainless steel tubes and outer sheath

Main characteristics of both cables are: small bending radius, which makes installation along the zones easier and devices monitoring possible; slim profile with minimal thermal inertia, ensuring quick heating up of the sensor cable in very early stages of the fire.




*1) this bi-directional bus communication ensures transmission of the alarm and fault states into the network of the fire alarm panels. The DTS unit can also be reset, zones switched on/off or put into test mode.*




# TECHNICAL DATA DTS DETECTOR

| | |
|---|---|
| Measurement distance range | 1km, 2km, 4km, 6km, 8 km, 10 km, 14 km or 16 km |
| No. of measurement channels | 1, 2 or 4 channels |
| Minimum sampling interval | 0,25 m |
| Minimum spatial resolution setting | 0,5 m |
| Measurement cycle time | from 1 s |
| No. of alarm zones per each channel | 2000 |
| Optical connectors | E2000, 8° angled |
| LED indicator | operation, measurement, fault, alarm |
| LCD display | 4 lines,16 characters,colors for different states,<br>Fire alarm and fault location |
| Internal measurement traces memory | 120 last measurement traces |
| Laser class (IEC 60825-1:2001) | 1 M (output power 17 mW) |
| Dry contact relays | 10, maximum load 1A/30VDC, optional up to 98 |
| Contact inputs | 4 |
| Communication interface | 2x Ethernet (LAN 10/100/1000), USB A, USB B |
| Communication protocol | SCPI, ASCII, optionally: MODBUS TCP, indirectly with multi-protocol gateway e.g. OPCUA, IEC 60870-5.104 etc. |
| Power supply | 10 to 30 V DC |
| Power consumption | approx. 22 W, at 20°C ambient temperature<br>(approx. 917 mA@24 V DC) |
| Operating temperature of DTS detector | -10°C to +60°C |
| Storage temperature | -40°C to +80°C |
| Relative air humidity range | 0% to 95% |
| IP rating | IP30 - 19" rack version / IP66 - wall mount version |
| Dimentions (WxHxD) | 800 x 600 x 220 mm - wall mount version<br>448 x 88 x 364 mm, 2 HU - 19" rack version |
| Weight | 7 kg to 9kg - wall mount version 9 kg to<br>7kg - 19" rack version |
| Certificates | RVS, EN54-22(VdS), UL521, ATEX, IECEx, SIL2 |
| Specification | EN 54-22:2015 + A1:2020, EN 54-13 in combination w. ESSER by<br>Honeywell FlexES Control/IQ8Control |
| ATEX specification (optional) | EX II (1) DG, I M2 |
| Heat response class acc. EN54-22 | A1N, A2N, BN, CN, DN |

## TECHNICAL DATA SENSOR CABLE

| | SAFETY FRNC | STEEL FRNC |
|---|---|---|
| Diameter | 4,0 mm | 3,8 mm |
| Weight | 17 kg/km | 25 kg/km |
| Crush resistance | 100 N/cm | 960 N/cm |
| Tensile resistance | 1000 N (short time)<br>800 N (long time) | 1500 N (short time)<br>1100 N (long time) |
| Minimum bending radius | 20 x D mm (with tension); 15 x D mm (without tension) | |
| Optical fiber type | 2 x MM 50 / 125 µm | |
| Attenuation | 0,9 dB / km @ 1064 nm<br>0,25 dB / km @ 1550 nm | |
| Operating temperature (periodically <1h) | -50°C to + 150°C | |
| Operating temperature (constantly) | -40°C to + 85°C | |
| Installation Temperature | -5°C to + 50°C | |
| Operating during fire | 750°C for 2 hours | |
| Functional Integrity* | -50 °C to +750 °C | |

*Functional integrity of the sensor cable tested for 2 hours with min. flame temperature of 750 °C as per IEC 60331-25. Furthermore in tunnel fire testing it has been demonstrated that the functional integrity of the cable was maintained for several minutes with temperatures exceeding 1000 °C.

## ORDER INFORMATION

| | PART NO. |
|---|---|
| Linear heat detector DTS/LHD N45 - distance 1 km - Rack 19" | 971121.IN |
| Linear heat detector DTS/LHD N45 - distance 2 km - Rack 19" | 971122.IN |
| Linear heat detector DTS/LHD N45 - distance 4 km - Rack 19" | 971123.IN |
| Linear heat detector DTS/LHD N45 - distance 6 km - Rack 19" | 971124.IN |
| Linear heat detector DTS/LHD N45 - distance 8 km - Rack 19" | 971125.IN |
| Linear heat detector DTS/LHD N45 - distance 10 km - Rack 19" | 971126.IN |
| N45 1 sensor channels for Honeywell DTS detector | 971131.IN |
| N45 2 sensor channels for Honeywell DTS detector | 971132.IN |
| N45 4 sensor channels for Honeywell DTS detector | 971133.IN |
| Linear heat detector DTS/LHD N45 Advanced - distance 8 km - Rack 19" | 971221.IN |
| Linear heat detector DTS/LHD N45 Advanced - distance 10 km - Rack 19" | 971222.IN |
| Linear heat detector DTS/LHD N45 Advanced - distance 14 km - Rack 19" | 971223.IN |
| Linear heat detector DTS/LHD N45 Advanced - distance 16 km - Rack 19" | 971224.IN |
| N45 Advanced 1 sensor channels for Honeywell DTS detector | 971231.IN |
| N45 Advanced 2 sensor channels for Honeywell DTS detector | 971232.IN |
| N45 Advanced 4 sensor channels for Honeywell DTS detector | 971233.IN |
| N45 License Modbus TCP/IP interface | 971129.IN |
| N45 44 additional outputs | 971134.IN |
| N45 88 additional outputs | 971135.IN |
| N45 in version for wall mounting | 971141.IN |
| N45 Outdoor Housing with Window for wall mounting Verison | 971142.IN |
| HD Outputs connection set w. connection block for additional outputs | 971139.IN |
| HD I/O connection set w. connection block for the 4 inputs and 10 outputs | 971239.IN |
| HD Outputs connection w. open end | 9711340.IN |
| N45 ATEX, IECEx certification for Zone 1, 21, Mb | 971112.IN |
| N45 ATEX, IECEx certification for Zone 0, 20, Ma | 971111.IN |
| N45 One Year DTS Warranty Extension | 971113.IN |
| FO sensor cable Safety FRNC for Honeywell DTS | 970150.IN |
| 2 sensor cable connectors preassembled on one end of FO sensor cable 970150.IN | 970151 |
| FO sensor cable Steel FRNC for Honeywell DTS | 970153.IN |

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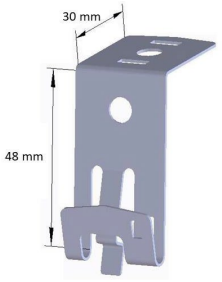
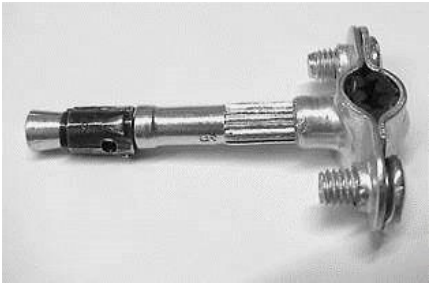
| | |
|---|---|
| 2 sensor cable connectors preassembled on one end of FO sensor cable 970153.IN | 970154 |
| Cable Drum for each sensor cable length up to 8km 970150.IN and up to 8.5km 970153.IN | 971153.IN |
| E2000 APC 8° Pigtail, 5m | 970154.IN |
| Adapter for connecting two E2000 plugs | 970161 |
| Sensor tube cutting tool for steel FRNC sensor cable | 970165.IN |
| Set of Polyamide clamps and zinc-plated steel dowel (100 pieces) | 970140.IN |
| Set of polyamide clips and stainless steel dowel[2] (100 pieces) | 970142.IN |
| Set of polyamide clips and special HCR dowel[3] (100 pieces) | 970141.IN |
| Cable ties with double head PA6.6W up to 85°C (500 pcs) | 970148 |
| Mounting Kit - Zinc Plated Steel Anchors (100 pieces) | 970143.IN |
| Mounting kit[2] - Stainless steel dowels[5] (100 pieces) | 970145.IN |
| Safety clamp set[4] - HCR dowel[3] (100 pcs) | 970149.IN |
| Versatile Cable Clamp[5] (500pc) | 971240.IN |
| Micro splice box IP20 for Honeywell DTS FO sensor cables | 970146.IN |
| Heavy duty splice box IP67 aluminum for Honeywell DTS FO sensor cables | 970147.IN |
| Anchor setting tool | 970144.IN |
| Sensor cable heating testing tool | 970151.IN |

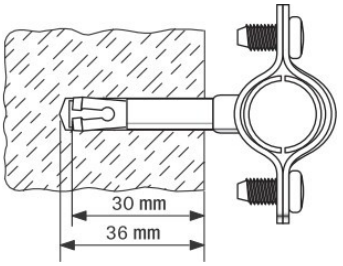
2) **corresponds to V4A steel grade 1.4401 (corrosion class III)**
3) **corresponds to steel grade 1.4529 (corrosion class IV)**
4) **corresponds to steel grade 1.4547 (corrosion class V)**
5) **corresponds to V4A steel grade 1.4571 (corrosion class III)**

Versatile Cable Clamp



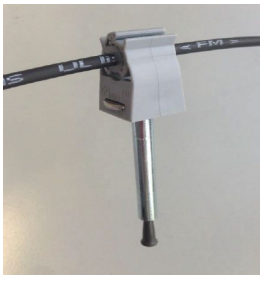

Mounting Kit






Safety clamp set

Set of Polyamide clamps



Cable ties with double head

For more information please see products catalog or installation and user manuals.

**For more information**
www.hls-austria.com

Part No. AT1013.GO | AT | 09/2024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