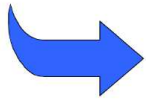
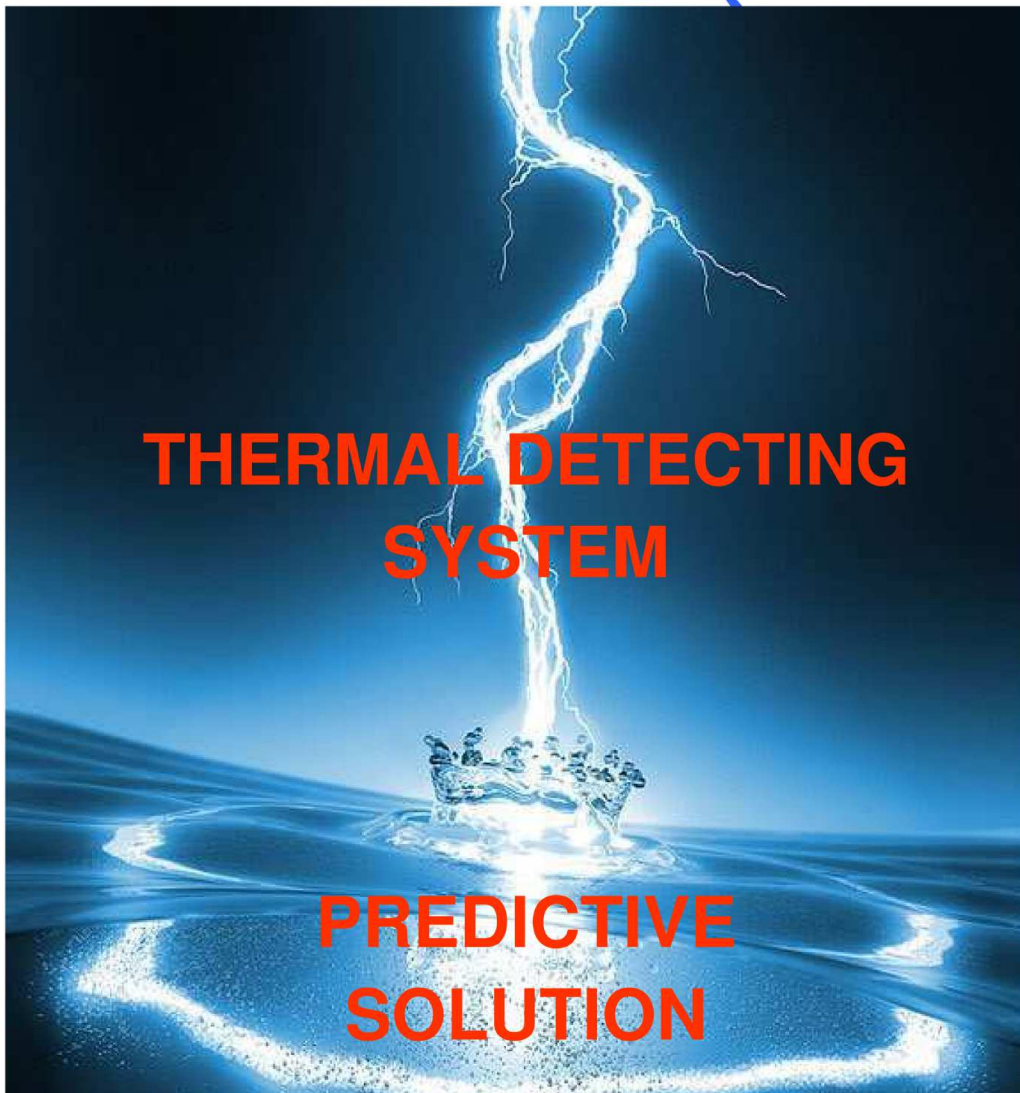


# **ELECTRONSYSTEM MD**

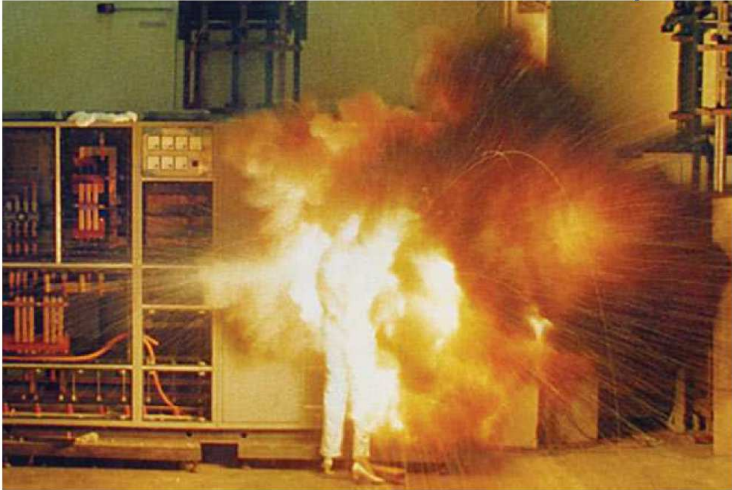


- *Design and products for safety problem solving in low and high voltage electrical installations*

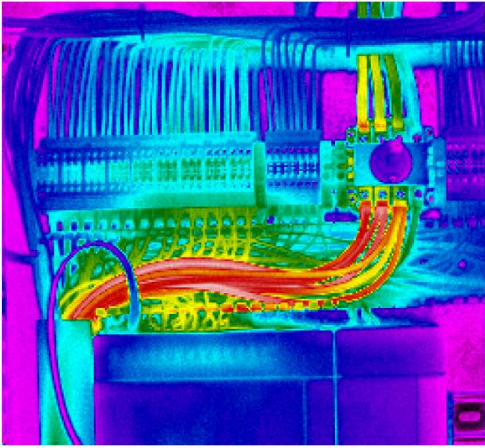
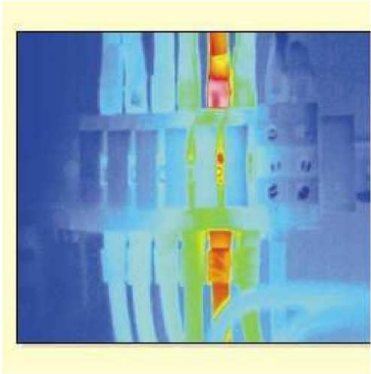


Electronsystem MD srl via Madonna delle Rose 72 - 24061 Albano S.A. (BG) - ITALY  
tel ++39 35 584000 fax ++39 35 584099  
info@elec.md.it

# **ELECTRONSYSTEM MD**



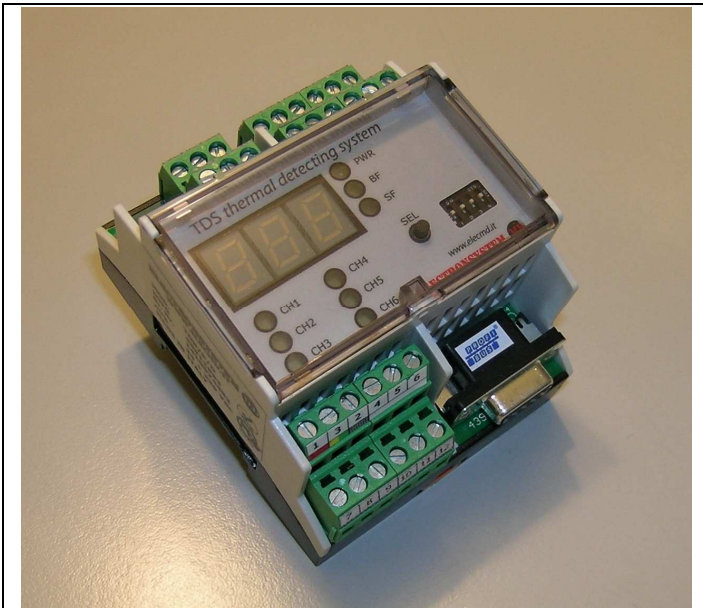
## **THERMAL DETECTING SYSTEM**



## **PREDICTIVE SOLUTION**



Electronsystem MD srl via Madonna delle Rose 72 - 24061 Albano S.A. (BG) - ITALY  
tel ++39 35 584000 fax ++39 35 584099  
info@elecemd.it



TDS devices are useful to detect the temperature of hazard part or live part of medium and high voltage apparatus due to contact-less technology.

The very small and reliable sensor can be easily mounted near target zone and is remoted to control unit by electrical shielded cable.

The control unit is locally operated and can manage up to 6 independent channels-sensors in order to cover a wide area of cubicle.

The local indication allow operator to have a clear and fast understanding of thermal situation inside cubicle.

Each alarm is indicated by red led and a selectable led display could be scrolled to show in real time the temperature detected by each sensor.

A customization of alarm and lock temperature is available on front of device by selecting the dip-switch.

Digital transmission by Modbus RTU or Profibus DP-V0 is available if a net is required.

Standard changeover contacts are also available for remoting over-temperature dangerous signalling.

A realtime diagnostic supervises both the device and sensors and allow to get a safe system: if a failure is occurring a specific changeover contact is operated.

## TDS/x/x

### Technical features

Rated input voltage :	.....24-220 VDC
Input :	..... 1-6 Thermopile sensors
Output:	.....1x changeover contact for alarm
	.....1x changeover contact for lock
	.....1x changeover contact for failure
Digital output: ..	Modbus RTU RS485, Profibus DPV0
Local indication: .....	PWR aux power on
	1-6 CHX led with multicolour indication
	Green: temperature OK
	Yellow: temperature ALARM
	Red: temperature LOCK
Temperature Thresholds:.....	selectable by dip.switch
Electrical connection: .....	electrical shielded bus cable
Max distance link:.....	10m
Temperature range : .....	-30°C ÷ 70°C
IP degree protection : .....	control unit IP54
	..... sensor IP65
Mounting arrangement:.....	DIN RAIL

### Sensor Features

Technology:.....	microcontrolled contactless pyrometer
Output:.....	amplified and compensated signal
Temperature reading: .....	-30°C – 250°C
	Factory temperature compensation
Accuracy.....	+/- 5°C typical @ mid range
Spot to ratio: .....	8:1
Type of measurement: .....	area integration on spot
Response time:.....	0.2s
Max link distance: .....	10m
Surface of object:.....	dark and matt*
	* other reflective surfaces could reduce accuracy

### Relay features

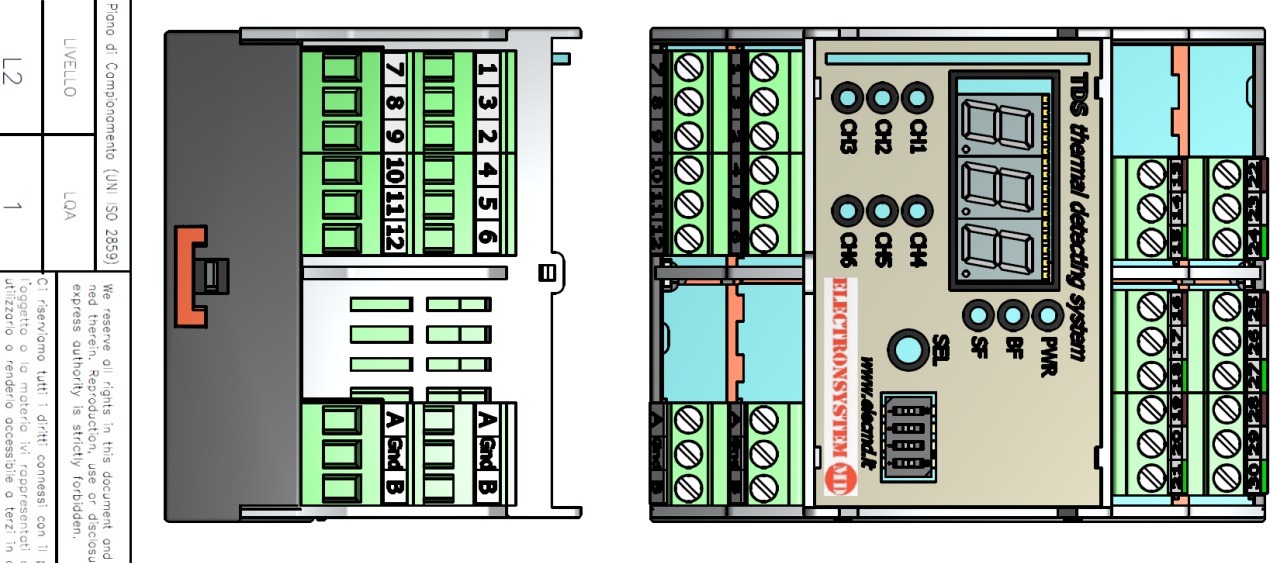
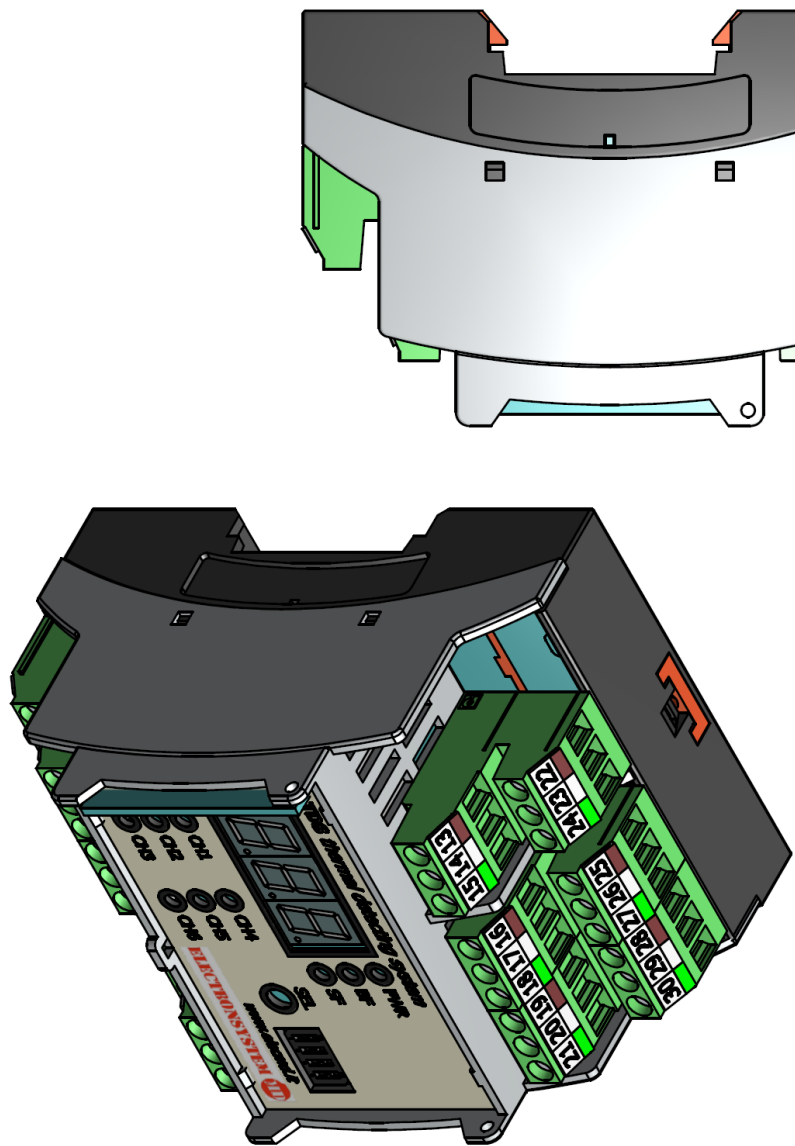
Contact material :	.....Ag+Au clad
Rated current /Max peak current: .....	1A
Rated voltage/Max switching voltage:.....	30/110 Vdc
Breaking capacity DC1 30/110:.....	1/ 0.3 A
Minimum switching load:.....	10microA 10mVDC
Mechanical life:.....	5*10 <sup>7</sup> cycles
Electrical life @ 1A 30Vdc:.....	2X*10 <sup>5</sup> cycles
Insulation between coil and contacts:.....	1,8kVrms
Dielectric strength between open contacts:..	0,75kVrms

### Directives and standards applicable

EMC directive :	..... 2004/108/EC
RoHS directive : .....	2002/95/EC
Low voltage directive: .....	2006/95/EC
EN 55011: .....	(ISM) radio-frequency equipment
EN 61000-4-2: .....	Imm. to electrostatic discharge (ESD)
EN 61000-4-3: .....	Imm. to radiated RF electromagnetic fields
EN 61000-4-4:.....	Imm. to electrical fast transients - Burst
EN 61000-4-5: .....	Immunity to Surge
EN 61000-4-6: .....	Imm. to induced by RF fields
EN 61000-4-11: .....	Imm. to voltage dips and short interruptions
EN 61000-6-2:2005: .....	(EMC) - Industrial emission
EN 61000-6-3:2007: .....	(EMC) - Residential emission
EN 61000-3-3:2002: .....	(EMC) - Flicker

# TDS thermal detecting system

Rev./Mod Data

Rev./Mod A Descrizione: FIXED AUX PIN CONNECTOR UPDATED TABLE BUS	Data 20.10.2014	Rev./Mod B Descrizione: FIXED PIN CONNECTOR	Data 21.10.2014	Rev./Mod C Descrizione: ADD MOBUS VERSION	Data 10.06.2019	Rev./Mod Descrizione:	Data	Rev./Mod Descrizione:	Data	Rev./Mod Descrizione:	Data																																																	
																																																												
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# TDS thermal detecting system

TDS 10.06.2019

<p>Rev./Mod A    Data 20.10.2014 Descrizione: <b>FIXED AUX PIN CONNECTOR</b> <b>UPDATED TABLE BUS</b></p>	<p>Rev./Mod B    Data 21.10.2014 Descrizione: <b>FIXED PIN CONNECTOR</b></p>	<p>Rev./Mod C    Data 10.06.2019 Descrizione: <b>ADD MODBUS VERSION</b></p>	<p>Rev./Mod    Data Descrizione:</p>
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**DESCRIPTION**

6 x independent temperature input sensors  
 dwg. 43911994 IR contactless sensor  
 - Wide aux voltage: 24±220 Vdc  
 - Local indications of alarm and lock for each input channel  
 - 1 x remote contact for indication of over heating alarm  
 - 1 x remote contact for indication of over heating lock  
 - LED display for local indication of temperature for each channel  
 - 3 x preset thresholds for alarm  
 - 3 x preset thresholds for lock

**PURCHASE CODE**

Description : Thermal Detecting System

Code : TDS/ / /

D: version with LED Display  
 M: version without LED display  
 C: output contacts + Profibus  
 P: output contacts + Modbus  
 M: output contacts + Modbus

**FEATURES**

**MODBUS CONNECTION**

**PROFIBUS CONNECTION**

**NOT SUPPLIED**

BF	SF	FAULT CONDITION
Off	Off	Everything OK
On Blinking	Off	No communication
Off	On	Parameter NOT OK
On	Off	Configuration NOT OK

<p>Fig. _____</p> <p>Material/Materiale _____</p>	<p>Filing Room _____</p> <p>Archivio _____</p> <p>Thermal quality, tolerance Tolleranza (Fatti qualità) Tg-65° UNI 5541-65</p> <p>Coord./Purchasing N.C. mech. _____</p> <p>Coord. purchas. o C.N. _____</p> <p>AS11 _____</p>	<p>Prep. C. FORLANI</p> <p>App. P. GUZZETTI</p> <p>Rev./Mod. 01 29.04.2014 : Emissione nuovo disegno</p>	<p>Resp. Dep. Uff. Tecnico</p> <p>Resp. Uff. Resp. _____</p>	<p>Title Thelo <b>TDS</b></p> <p>Apparechius Apparechchio</p> <p>Doc. No. <b>43911993</b></p>
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<p><b>Contact scheme</b></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1 (+)</td> <td>AUX + (24 + 220 Vdc)</td> </tr> <tr> <td>2 (-)</td> <td>AUX -</td> </tr> <tr> <td>3</td> <td>Earth</td> </tr> <tr> <td>4</td> <td>ERROR (normally open, close with error or without auxiliary power)</td> </tr> <tr> <td>5</td> <td>ERROR (normally open, close with alarm)</td> </tr> <tr> <td>6</td> <td>ALARM (normally open, close with alarm)</td> </tr> <tr> <td>7</td> <td>9</td> </tr> <tr> <td>8</td> <td>12 LOCK (normally open, close with alarm)</td> </tr> <tr> <td>10</td> <td>11</td> </tr> <tr> <td>11</td> <td>12 LOCK (normally open, close with alarm)</td> </tr> <tr> <td>10</td> <td>13 (+) INPUT SENSOR 1 (dwg 43911994)</td> </tr> <tr> <td>13 (+)</td> <td>14 (-) INPUT SENSOR 2 (dwg 43911994)</td> </tr> <tr> <td>14 (-)</td> <td>15 (out) INPUT SENSOR 3 (dwg 43911994)</td> </tr> <tr> <td>15 (out)</td> <td>16 (+) INPUT SENSOR 4 (dwg 43911994)</td> </tr> <tr> <td>16 (+)</td> <td>17 (-) INPUT SENSOR 5 (dwg 43911994)</td> </tr> <tr> <td>17 (-)</td> <td>18 (out) INPUT SENSOR 6 (dwg 43911994)</td> </tr> <tr> <td>18 (out)</td> <td>19 (+) INPUT SENSOR 7 (dwg 43911994)</td> </tr> <tr> <td>19 (+)</td> <td>20 (-) INPUT SENSOR 8 (dwg 43911994)</td> </tr> <tr> <td>20 (-)</td> <td>21 (out) INPUT SENSOR 9 (dwg 43911994)</td> </tr> <tr> <td>21 (out)</td> <td>22 (+) INPUT SENSOR 10 (dwg 43911994)</td> </tr> <tr> <td>22 (+)</td> <td>23 (-) INPUT SENSOR 11 (dwg 43911994)</td> </tr> <tr> <td>23 (-)</td> <td>24 (out) INPUT SENSOR 12 (dwg 43911994)</td> </tr> <tr> <td>24 (out)</td> <td>25 (+) INPUT SENSOR 13 (dwg 43911994)</td> </tr> <tr> <td>25 (+)</td> <td>26 (-) INPUT SENSOR 14 (dwg 43911994)</td> </tr> <tr> <td>26 (-)</td> <td>27 (out) INPUT SENSOR 15 (dwg 43911994)</td> </tr> <tr> <td>27 (out)</td> <td>28 (+) INPUT SENSOR 16 (dwg 43911994)</td> </tr> <tr> <td>28 (+)</td> <td>29 (-) INPUT SENSOR 17 (dwg 43911994)</td> </tr> <tr> <td>29 (-)</td> <td>30 (out) INPUT SENSOR 18 (dwg 43911994)</td> </tr> </table>	1 (+)	AUX + (24 + 220 Vdc)	2 (-)	AUX -	3	Earth	4	ERROR (normally open, close with error or without auxiliary power)	5	ERROR (normally open, close with alarm)	6	ALARM (normally open, close with alarm)	7	9	8	12 LOCK (normally open, close with alarm)	10	11	11	12 LOCK (normally open, close with alarm)	10	13 (+) INPUT SENSOR 1 (dwg 43911994)	13 (+)	14 (-) INPUT SENSOR 2 (dwg 43911994)	14 (-)	15 (out) INPUT SENSOR 3 (dwg 43911994)	15 (out)	16 (+) INPUT SENSOR 4 (dwg 43911994)	16 (+)	17 (-) INPUT SENSOR 5 (dwg 43911994)	17 (-)	18 (out) INPUT SENSOR 6 (dwg 43911994)	18 (out)	19 (+) INPUT SENSOR 7 (dwg 43911994)	19 (+)	20 (-) INPUT SENSOR 8 (dwg 43911994)	20 (-)	21 (out) INPUT SENSOR 9 (dwg 43911994)	21 (out)	22 (+) INPUT SENSOR 10 (dwg 43911994)	22 (+)	23 (-) INPUT SENSOR 11 (dwg 43911994)	23 (-)	24 (out) INPUT SENSOR 12 (dwg 43911994)	24 (out)	25 (+) INPUT SENSOR 13 (dwg 43911994)	25 (+)	26 (-) INPUT SENSOR 14 (dwg 43911994)	26 (-)	27 (out) INPUT SENSOR 15 (dwg 43911994)	27 (out)	28 (+) INPUT SENSOR 16 (dwg 43911994)	28 (+)	29 (-) INPUT SENSOR 17 (dwg 43911994)	29 (-)	30 (out) INPUT SENSOR 18 (dwg 43911994)	<p><b>Front panel indication</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>PWR:</b> Auxiliary power on</li> <li><input type="checkbox"/> <b>Green</b> blinking: OK</li> <li><input type="checkbox"/> <b>Red:</b> error</li> <li><input type="checkbox"/> <b>BF:</b> Bus Fault</li> <li><input type="checkbox"/> <b>SF:</b> System Fault</li> <li><input type="checkbox"/> <b>CHx</b> Alarm CHx indication</li> <li><input type="checkbox"/> <b>Green:</b> CH OK</li> <li><input type="checkbox"/> <b>Red:</b> CH over heated lock</li> <li><input type="checkbox"/> <b>Yellow:</b> CH heated alarm</li> <li><input type="checkbox"/> <b>SEL</b></li> </ul> <p>Single press: Reset/address          Continuous Press: Set IP address</p> <p><b>Temperature Threshold selection</b></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Alarm</td> <td>Lock</td> </tr> <tr> <td>90° C</td> <td>110° C</td> </tr> <tr> <td>115° C</td> <td>120° C</td> </tr> <tr> <td>120° C</td> <td>40° C</td> </tr> </table> <p>* standard settings          ** different thresholds on request</p>	Alarm	Lock	90° C	110° C	115° C	120° C	120° C	40° C
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# TDS thermal detecting system

TDS 10.06.2019

Rev./Mod Descrizione: ...	Data ...	Rev./Mod Descrizione: ...	Data ...	Rev./Mod Descrizione: ...	Data ...	Rev./Mod Descrizione: ...	Data ...	Rev./Mod Descrizione: ...	Data ...
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Distance to spot size ratio

SW 23

LX = 3 - 10 m (Standard 6 meters)

**FEATURES:**

- Small
- Low cost
- Non contact infrared sensor
- Ambient temperature compensated
- Factory calibrated
- Amplified output - > robust output signal even with EMI
- Thermopile technology
- Immune to sun or halogen lamp\* (G9 filter on request)

**DATA:**

- Max temperature object: 300°C
- Response time: 150 msec
- Optical view cone: 8°
- Distance to spot size ratio: 8:1
- Factory calibrated
- Output: amplified analog signal
- Input: 2 wire

**Color Code:**

Green	Out
White	- Vdc
Brown	+ Vdc

Plano di Completamento (UNI ISO 2859)

LIVELLO	LOA
L2	1

App. M. Bosisio

Resp. Dep. Uff. Tecnico

Apparatus

Doc. No. 43911994

Scale

1 : 1

SP. No.

1

Fig. ...

Filing Room

Archivio

Thread quality tolerance

Tolleranza filetti qualità

\*Eg-65\* UNI 5541-65

Material/Materiale

General tolerance for machining / Tolleranze generali per lavorazioni meccaniche:

Coord. punzon. o C.N.

ISO 11

Quality for linear dimension

Qualità per quote lineari

ISO 11

Prep. M. Vescovi

Dis. /

Resp. Dep. Uff. Tecnico

Uff. Resp.

Uff. Tecnico

Uff. Resp.

Rev./Mod. 10

13/06/2014

Emissione nuovo disegno

**ELECTRONSYSTEM MD S.r.l.**

Fig. ...

N° Series / Serie

Finishing / Finitura

Scale

1 : 1

SP. No.

1

\\srv2k12\archivio\Electronsysteam MD\archivio\_Cad\Valida elettronica\43931\_43931035.diam

# TDS thermal detecting system

TDS 10.06.2019

## Table of Telegram

Registry	Information	Type	Function
Reg_0	ID slave	Signed Int	Read/Write
Reg_1	Temperature CH1 [°C/10]	Signed Int	Read only
Reg_2	Temperature CH2 [°C/10]	Signed Int	Read only
Reg_3	Temperature CH3 [°C/10]	Signed Int	Read only
Reg_4	Temperature CH4 [°C/10]	Signed Int	Read only
Reg_5	Temperature CH5 [°C/10]	Signed Int	Read only
Reg_6	Temperature CH6 [°C/10]	Signed Int	Read only
Reg_7	CH1 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	Signed Int	Read only
Reg_8	CH2 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	Signed Int	Read only
Reg_9	CH3 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	Signed Int	Read only
Reg_10	CH4 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	Signed Int	Read only
Reg_11	CH5 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	Signed Int	Read only
Reg_12	CH6 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	Signed Int	Read only
Reg_13	Alarm CH1-CH6 (1=ON, 0=OFF)	Binary	Read only
Reg_14	Lock CH1-CH6 (1=ON, 0=OFF)	Binary	Read only
Reg_15	Alarm status (1=ON, 0=OFF)	Signed Int	Read only
Reg_16	Lock status (1=ON, 0=OFF)	Signed Int	Read only
Reg_17	Alarm level [°C/10]	Signed Int	Read only
Reg_18	Lock level [°C/10]	Signed Int	Read only
Reg_19	Life signal (seconds)	Signed Int	Read only
Reg_20	Rev.	Signed Int	Read only

### Protocol settings

<b>ADDRESS</b>	<b>130 default</b>
<b>Protocol</b>	<b>Modbus RTU</b>
<b>Speed</b>	<b>19200 Baud</b>
<b>Data</b>	<b>8 bit</b>
<b>Parity</b>	<b>Even parity</b>
<b>Stop</b>	<b>1 bit stop</b>

### Example

Registry	Description	Bit reading [bit]	Value	Unit
0	ID slave	130	130	
1	Temperature CH1 [°C/10]	168	16,8	[°C]
2	Temperature CH2 [°C/10]	210	21	[°C]
3	Temperature CH3 [°C/10]	480	48	[°C]
4	Temperature CH4 [°C/10]	1212	121,2	[°C]
5	Temperature CH5 [°C/10]	150	15	[°C]
6	Temperature CH6 [°C/10]	1800	180	[°C]
7	CH1 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	1	1	
8	CH2 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	1	1	
9	CH3 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	1	1	
10	CH4 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	2	2	
11	CH5 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	1	1	
12	CH6 Sensor status (1=OK, 2=NOT OK, 4=HIGH)	4	4	
13	Alarm CH1-CH6 (1=ON, 0=OFF)	0000 0000 0010 1000		
14	Lock CH1-CH6 (1=ON, 0=OFF)	0000 0000 0010 0000		
15	Alarm status (1=ON, 0=OFF)	1	1	
16	Lock status (1=ON, 0=OFF)	1	1	
17	Alarm level [°C/10]	1200	120	[°C]
18	Lock level [°C/10]	1400	140	[°C]
19	Life signal (seconds)	615	615	[seconds ]
20	Rev.	1	1	