



Datalogger D4000



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Datalogger D4000



WARNINGS



This instrument must be utilized only for the application it has been designed for, OTR declines all responsibility for any improper use;



Use only the power supply and cables provided;
Do not recharge for more than 12 Hours;



Do not use the instrument near potentially explosive gases;



Do not connect the instrument with sensors placed in water where an electric dissipation is in progress;



Use protective gloves; Do not connect the instrument to the readout unit with wet hands;

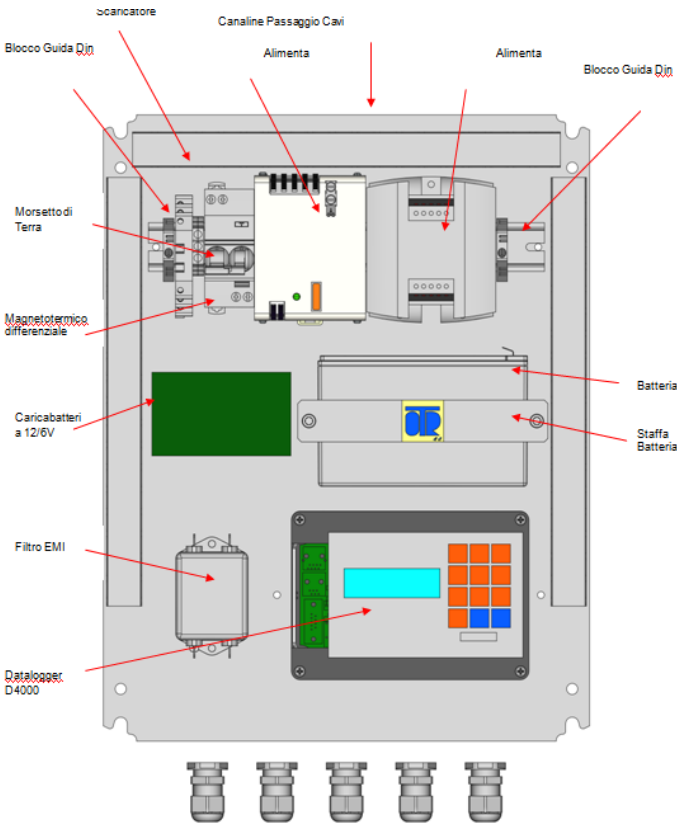
Inoltre

- Do not open the instrument, contact the manufacturer for checks and repairs;
- Keep out of reach of children;
- During the recharge phase don not touch the datalogger with wet hands;
- During the recharge phase, disconnect the datalogger from the probe or from any device connected to the AC power supply (e.g. Personal Computer by USB);
- Clean the instrument and its cable with alcohol or water, do not use acetone or aggressive liquids for plastics or labels.
- Use only its original power supply unit to recharge the datalogger;

Applications

8-16-32 channels Dataloggers D800, D1600 and D3200 are used in Geotechnical, Structural and Enviromental fields with mV or mA sensor to monitoring:

- Electric piezometers;
- Vibrating Wire;
- Surface Clinometers;
- Crack meters and Joint meters;
- Temperatour sensors;
- Conductometers.



Identification

Every Datalogger is identified:

- Serial number associated to calibration report;
- Model;

Technical Specification

Input	0-2V 4-20 mA
Output	+15V , 2.048 Vref Swee p
Power Supply	6V dc



Datalogger's use

Start

Datalogger is normally off, but it can turn automatically on to perform data acquisitions.

When datalogger is off, it can still be turned on using the "ON" key on its keypad. After a manual power-up, the display lights up and the following information is presented to the user:

- Datalogger's ID;
- Date & Time;
- Battery charge;

A menu is then shown, which can be browsed with the "up/down" arrows and selected with the "OK" key.

Keyboard's use

Following start of the datalogger, a menu is shown to the user, browsable by arrows.

The menu items are:

- "Exit";
- "Show date" ;
- "Show timer";
- "Acquisition";
- "Start Acquisition";
- "Modem On/Off";
- "Acquisition On/Off";
- "Datalogger Off".

The keys perform the following operations:

OK key: select a menu item, or confirm an operation;

ESC key: exit the selected menu item, canceling the operation;

up/down arrow: browse the menu or the various options presented on the display.

Switch Off

At any time the datalogger can be turned off manually by using the OFF key on the keypad.

When the datalogger is turned off, the user is shown the date and time of the next automatic acquisition set.

Datalogger's connection

Datalogger's access

Either an Ethernet connection or a serial connection can be used to access the datalogger.

Connection to datalogger can be made only if an automatic acquisition operation is not already in progress.

In that case wait until the datalogger is turned off, only then start the connection.

Ethernet cable connection

The following steps should be performed for access via Ethernet cable:

- 1- Turn on datalogger manually by pressing the ON key on the keypad;
- 2- Open browser;
- 3- Type the address 192.168.1.86 into the address bar;
- 4- Enter correct username and password (username: Admin, no password).

To make a connection via Ethernet cable, the datalogger must have been turned on manually with the ON button.

After a few seconds, if the network cable is plugged into the datalogger and the computer or network router, the Ethernet connection will start.

The network settings set by manufacturer are the following:

Datalogger IP: 192.168.1.86

Subnet Mask: 255.255.255.0

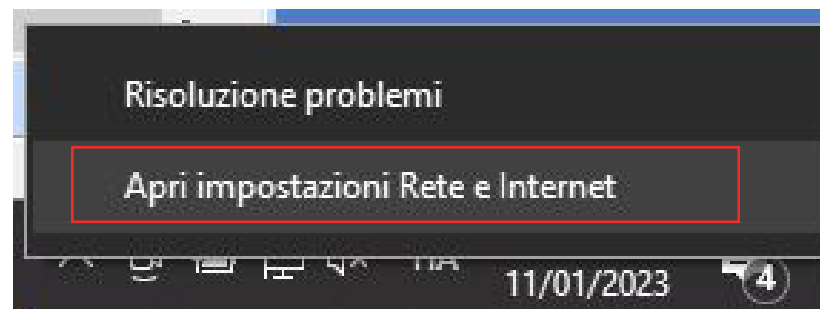
Gateway: 192.168.1.1

If your network needs different settings, you should establish a direct connection with your PC to change the network settings.

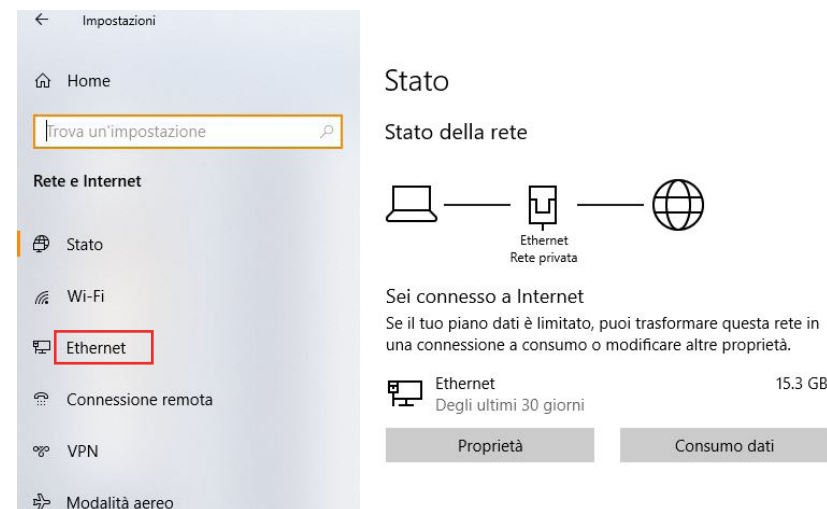
Change network settings

To firstly directly connect to your PC via Ethernet cable, you need to:

- Temporarily disable the Wi-Fi of your PC
- Open the control panel, "Network and Internet Settings" item



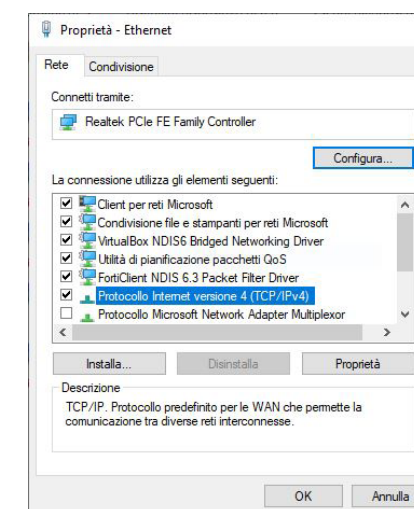
- Select Ethernet



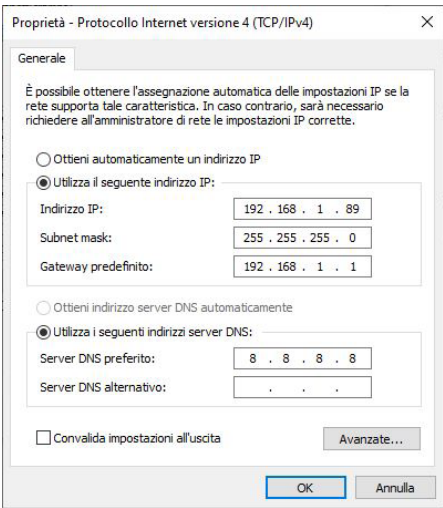
- Click on Edit Tab Options



- Right-click the Ethernet connection being used.
- Choose the Properties item
- Select Internet Protocol version 4 (TCP/IP)
- Click on Properties



- TCP/IPV4 screen will be displayed



- Copying and pasting the IP address into your browser will give you access to Webserver.

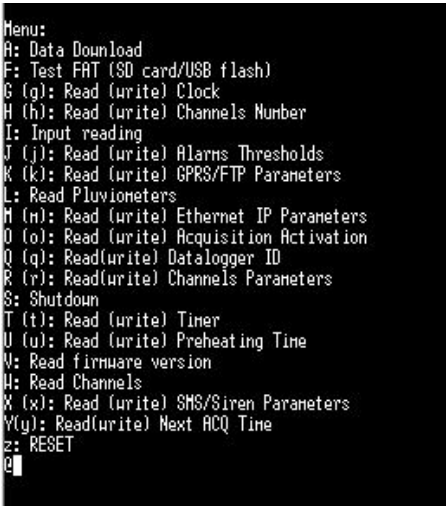
Serial cable connection

The following steps must be performed for access via serial connection:

- 1-Use the serial cable provided by OTR;
- 2-open a terminal program (e.g., Teraterm);
- 3-Set the connection speed to 115200 baud;
- 4-Wait for the menu to appear on the screen.

Connection to the datalogger can be made only if an automatic acquisizione operation is not already in progress.
In that case, wait until the datalogger is turned off, and only then start the connection.

- The following screen is displayed after successful connection.

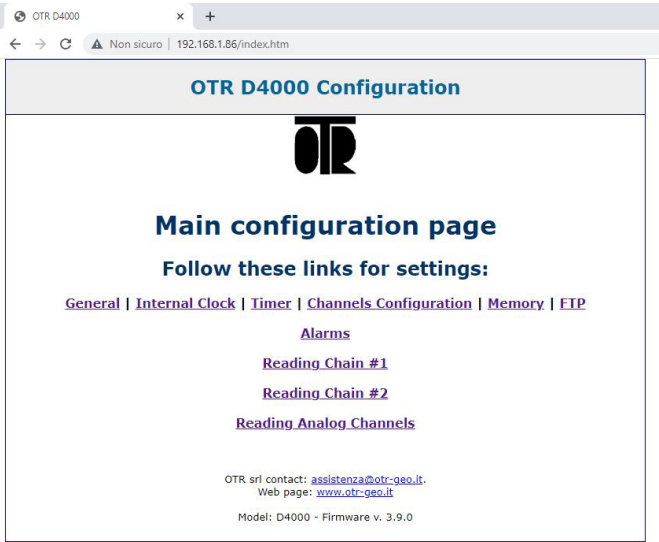


- Following the directions in the on-screen menu changes the relevant parameters.



Home

Home Menu



The main screen provides several features, corresponding to the words in violet, which can be selected with a click of the mouse:

- General: directs to the ECU name editing screen;
- Internal Clock: directs to the date/time and next reading setting screen;
- Timer: directs to the screen to set the interval between measurements;
- Channels Configuration: directs to the screen for configuring the channels to be read;
- Memory: directs to the screen dedicated to summarizing and exporting the device memory;
- FTP: addresses to the screen dedicated to connectivity;
- Alarms: addresses to the alarm configuration screen;
- Reading Chain #1: addresses to the screen that allows you to read the values detected by the first digital inclinometer chain;
- Reading Chain #2: addresses to the screen that allows you to read the values detected by the second digital inclinometer chain;
- Reading Analog Channels: addresses the screen that allows you to read the values detected by the analog sensors.

Rename datalogger

“General” screen

Clicking on “General” brings up this screen that allows you to change the name of the control unit.

Deleting the contents of the box: “D4000” and replacing it with the predetermined name renames the datalogger.

Having defined the name of the datalogger, click “Save” to save.

To reestablish the last saved name, click “Read”; in case you do not want to save the changes you made.

Date and Time Screen

Inner clock

Clicking on: “Internal Clock” brings up the previous screen with two items:

- “Internal Date and Time” which identifies the time recorded in the controller;
- “Next Acquisition” which displays the selected time of the next acquisition.

Both settings are editable manually.

Once entered, click “Save” to imprint them into the D4000.

To reestablish the last saved settings click: “Read” before saving.

Timer

Timer settings

D4000 Configuration

OTR

Home > Timer

Timer [hh:mm:ss]

00:15:00

Pre-heating time [sec]

1

Read

Save

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- Clicking on “Timer” displays the screen used for scheduling automatic readings.
- The “Timer” item allows you to set the wait between consecutive measurements;
 - The “Pre-heating Time” item allows you to set how early the instruments will turn on before the measurement is recorded..

Once the settings have been customized, click “Save” to imprint them into the D4000.
To reestablish the last saved settings, click “Read” before saving..

Channels

Channel Configuration

D4000 Configuration

OTR

Home > Channels

Digital Sensors in chain #1

1

Configure

Reset

Digital Sensors in chain #2

0

Configure

Reset

MUX Channels

25

Configure

Reset

Channels Type

Pluviometer Factor

0.20

On

Off

Read

Save

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- Clicking “Channels” will take you to the channel configurarion.
- In the two entries: “Digital sensors in chain #1” and “Digital sensors in chain #2”; the number of probes comprising, respectively, chain one and two will be entered;
 - “Mux Channels” identifies the number of analog sensors wired to the Multiplexers (optional).

For these values, clicking “Reset” resets the default values.
“Configure” allows you to enter the page for the corresponding item and view its contents.
For the items: “Digital sensors in chain #1” and “Digital sensors in chain #2”; 4 outputs will be created for each probe set.
For the item: “Mux Channels”; the type of sensor wired to the multiplexer is associated, channel by channel.
“Channels type,” on the “Mux Channels” line, allows the units of measurement of the Mux outputs to be set.
“Pluviometer Factor” enables the pluviometer reading, if it’s availbe, by selecting “On” and disables it by selecting “Off.”
“Pluviometer Factor” is associated with a value that is the instrument’s accumulation constant. For the pluviometer’s factor, in case of rain gauges provided by OTR, it will not be necessary to change the value.
In case the accumulation factor is higher or lower than the one provided by OTR it will be necessary to adjust the parameter to avoid measurement errors.
The “Read” button at the bottom of the screen allows you to go back to the last display of the values saved in the panes.
“Save” overwrites the manually edited data.

Digital chains

Configuration of digital chains

D4000 Configuration

Home > Channels > Digital Chain #1

#	Name	El. Zero	El. FS	Ph. Zero	Ph. FS
001	Y1	0.000	1.000	0.000	1.000
002	X1	0.000	1.000	0.000	1.000
003	T1	0.000	1.000	0.000	1.000
004	Z1	0.000	1.000	0.000	1.000

Read Save

O.T.R.

O.T.R. s.r.l. All rights reserved.

From the “Channels” screen, clicking on “Digital chain #1” will select the first chain of digital probes.

Depending on the number of probes, 4 variables will be generated per probe: X and Y corresponding to the tilts; T the temperature recorded by the probe; Z is the settling (only for instruments that provide it).

Threshold values are set manually.

The table displays the columnsns:

- “#”: output number;
- “Name”: name of the measured variable;
- “El. Zero”: electrical value measured at point 0;
- “El. Fs”: electrical value measured at the full scale point;
- “Ph. Zero”: physical value measured at point 0;
- “Ph. Fs”: physical value measured at the full scale point.

The constant proportion between 0 and electrical Fs and 0 and physical Fs can be changed according to values typed into the cells.

Clicking “Read” will cause the instrument to print the parameters set at the last save on the screen.

Pressing “Save” will save the changes made.

Multiplexer

Mux channel configuration

Home > Channels > Multiplexers

#	Name	El. Zero	El. FS	Ph. Zero	Ph. FS
000	A	4000	2000	0.000	50
001	B	0.000	20000	0.000	100
002	C	0.000	15000	0.000	2
003	D	0.000	15000	0.000	2
004	E	0.000	15000	0.000	2
005	F	0.000	15000	0.000	2
006	G	0.000	15000	0.000	2
007	H	0.000	15000	0.000	2
008	I	0.000	15000	0.000	2
009	J	0.000	15000	0.000	2
010	K	0.000	1	0.000	1
011	L	0.000	1	0.000	1
012	M	0.000	1	0.000	1
013	N	0.000	1	0.000	1
014	O	0.000	1	0.000	1
015	P	0.000	1	0.000	1

Read Save

01-16 | 17-32 |

From the “Channels” screen by clicking on: “Multiplexers” you enter the section dedicated to value settings for analog channels.

The table on the page is set up with the following columnsns:

The table displays the columnsns:

- “#”: output number;
- “Name”: name of the measured variable or probe set;
- “El. Zero”: electrical value measured at point 0;
- “El. Fs”: electrical value measured at the full scale point;
- “Ph. Zero”: physical value measured at point 0;
- “Ph. Fs”: physical value measured at the full scale point.

The proportion constant between 0 and electrical Fs and 0 and physical Fs can be changed according to the values in the cells.

Clicking “Read” causes the instrument to print the parameters set at the last save on the screen.

Clicking “Save” saves the changes made.

Channel type Mux

Home > Channels > Multiplexers

#	Name	Type	Description
000	A	2	4-20 mA
001	B	3	Potentiometer
002	C	1	mV
003	D	1	mV
004	E	1	mV
005	F	1	mV
006	G	1	mV
007	H	1	mV
008	I	5	VW (500-5000 Hz)
009	J	1	mV
010	K	1	mV
011	L	1	mV
012	M	1	mV
013	N	1	mV
014	O	1	mV
015	P	5	VW (500-5000 Hz)

Read Save

01-16 | 17-32 |

*** Channel Types ***
0: Off | 1: mV | 2: 4-20 mA | 3: Potentiometer | 4: NTC | 5: Vibrating Wire

Clicking on the “Channels”: “Channels type” screen; the previous screen divided into the following columns will be displayed:

- “#”: channel number;
- “Name”: channel name;
- “Type”: type of output;
- “Description”: description of “Type”, indicates, channel by channel, the type of sensor wired to the multiplexer (4-20mA, mV, VW...).

For Multiplexers: all channels are independent and nameable.
By following the legend, the output of the instrument connected to the Mux to a given channel can be identified.
Clicking “Read” prints on the screen the parameters set at the last save. “Save” saves the new settings.

Memory

Memory

D4000 Configuration

OTR

Home > Memory

Read Memory Delete Memory

Memory content:

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Clicking on “Memory,” from the “Home” screen, will open a screen with a box. The items present are these:

- “Read memory” instructs the instrument to print on the screen, step by step, from the last to the first measurement, and then allows exporting the data once “Stop reading” is clicked;
- “Download” appears after clicking “Stop reading” and allows exporting the data;
- “Delete memory”, after a confirmation, will allow to reset the memory of the control unit.

FTP

FTP settings

D4000 Configuration



Home > FTP Settings

FTP Server	ftp.otrmonitoring.it		
Send data via ethernet	☒		
FTP Server IP	144	76	170 253
MY IP	192.168.1.86		
SUBNET MASK	255.255.255.0		
GATEWAY	192.168.1.1		
DNS	8.8.8.8		
FTP APN	IBOX.TIM.IT		
FTP User	MYUSER		
FTP Password	MYPASSWORD		
FTP Directory	D4000		
FTP Port	21		
FTP Every	1		

Read Save

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- From the “Home” clicking on: “FTP settings” will take you to the dedicated screen.
- “FTP server” identifies the address of the remote FTP server to which measurements are sent;
 - “Send data via ethernet,” if checked, identifies that the datalogger communicates via an ethernet cable instead of using a GPRS network;
 - “FTP Server IP” corresponds to the IP address of the FTP server (to be changed only if data are not sent to OTR platforms. Only needed for sending data via Ethernet. Not necessary for sending data via GPRS);
 - “My IP” is the IP address of the Datalogger;
 - “Subnet Mask” indicates the network mask;
 - “Gateway”: identifies the IP of the Gateway;
 - “DNS” identifies the IP of the DNS of preference;
 - “FTP APN”: provided parameter of the datalogger sim, provided directly by the operator;
 - “FTP User”: identifies the user name to access the FTP server;
 - “FTP Password”: identifies the Password to access the FTP server;
 - “FTP Directory”: identifies the Directory to access the FTP server;
 - “FTP Port”: identifies the Port to connect to the FTP server;
 - “FTP Every” indicates how often the data is sent.

Allarms

Number of alarms

D4000 Configuration



Home > Alarms

Alarms for sensors in chain #1	1	Configure	Reset
Alarms for sensors in chain #2	0	Configure	Reset
Alarms for MUX sensors	25	Configure	Reset
Alarm Recipients		Configure	Reset
Alarm SMS Text		Configure	Reset
Local Alarm (Siren)		Configure	Reset

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From the “Home” screen and selecting “Alarms” will display the number of sensors corresponding to each item.
“Reset” resets the alarms corresponding to the chosen item.
“Configure” allows you to enter the chosen item to change the alarm values.

Digital alarm configuration

D4000 Configuration



Home > Alarms > Alarms for Digital Chain #1

#	On	Down 2	Down 1	Up 1	Up 2
001	01	-5	-2	2	5
002	01	-5	-2	2	5
003	00	-100000.000	-100000.000	100000.000	100000.000
004	00	-100000.000	-100000.000	100000.000	100000.000

Read Save

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From the “Alarms” screen by clicking on: “Alarms for Digital Chain #1”; you enter the section dedicated to setting alarm thresholds for the first digital inclinometer chain.

The table on the page is set up with the following columns:

- “#”: number of controlled variable;
- “On”: alarm operation status;
- “Down 2”: lower limit of alarm threshold;
- “Down 1”: lower limit of pre-alarm threshold;
- “Up 1”: upper limit of the pre-alarm threshold;
- “Up 2”: upper limit of alarm threshold.

In this section you can set the thresholds for the alarms of the 2 digital inclinometer chains.

Depending on the values selected, the ranges of use of the instrument without hazard warnings will be determined.

As you can see you have to set the values for 4 parameters.

Down 1, Up 1 correspond to the gap of the early warning threshold and Down 2, Up 2 to the alarm threshold.

Click “Save” to save the pre-set threshold setting.

On the “ON” column, “1” identifies the control on and “0” off.

If the threshold of the turned-on sensor exceeds the pre-alarm, “2” will be printed on the screen.

If the threshold of the sensor on exceeds alarm it will be printed “3” on the screen.

In case the compilation of an entry was wrong and you have not yet saved: clicking “Read” will return to the last parameter saved in memory.

Remember that each probe has 4 channels associated with it.

You will follow the same logic for setting the alarms of the second digital chain since the screen follows the same guidelines.

Multiplexer alarm configuration

D4000 Configuration



Home > Alarms > Alarms for Multiplexers

#	On	Down 2	Down 1	Up 1	Up 2
001	00	-100000.000	-100000.000	100000.000	100000.000
002	1	10	30	70	90
003	00	-100000.000	-100000.000	100000.000	100000.000
004	00	-100000.000	-100000.000	100000.000	100000.000
005	00	-100000.000	-100000.000	100000.000	100000.000
006	00	-100000.000	-100000.000	100000.000	100000.000
007	00	-100000.000	-100000.000	100000.000	100000.000
008	00	-100000.000	-100000.000	100000.000	100000.000

Read Save

00-08 | 08-16 | 17-24 | 25-32 |

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From the “Alarms” screen by clicking on: “Alarms for Multiplexer”; you enter the section dedicated to setting the Mux alarm thresholds.

When one or more multiplexers are associated with the D4000 datalogger; it is necessary to implement the configuration of the additional channels as well. It will occur exactly as for the configuration of digital chains but on a higher multiplicity of sensors.

The table on the page is set up with the following columns:

- “#”: number of controlled variable;
- “On”: alarm operation status;
- “Down 2”: lower limit of alarm threshold;
- “Down 1”: lower limit of pre-alarm threshold;
- “Up 1”: upper limit of the pre-alarm threshold;
- “Up 2”: upper limit of alarm threshold.

In this section, thresholds for analog sensor alarms can be set.

Depending on the values selected, the ranges for using the instrument without hazard alerts will be determined.

As you can see you have to set the values for 4 parameters.

Down 1, Up 1 correspond to the gap of the early warning threshold and Down 2, Up 2 to the alarm threshold.

Click “Save” to save the pre-set threshold setting.

On the “ON” column, “1” identifies the control on and “0” off.

If the threshold of the turned-on sensor exceeds the pre-alarm, “2” will be printed on the screen.

If the threshold of the sensor on exceeds alarm it will be printed “3” on the screen.

In case the compilation of an entry was wrong and you have not yet saved: clicking “Read” will return to the last parameter saved in memory.

Warning contact customization

Home > Alarms > Alarms Recipients

#	Active Thr.1 (Preallarme)	Active Thr.2 (Allarme)	Number
001	☐	☐	3470123456
002	☐	☐	3470123457
003	☐	☐	3470123458
004	☐	☐	3470123459
005	☐	☐	3470123450
006	☐	☐	
007	☐	☐	
008	☐	☐	
009	☐	☐	
010	☐	☐	
011	☐	☐	
012	☐	☐	
013	☐	☐	
014	☐	☐	
015	☐	☐	

Read Save

From the “Alarms” screen, clicking on “Alarms Recipients” will display the screen used for contacts who will receive alarm alerts.

The table is set up as follows:

- “Active Thr.1 (Pre-alarm)”: allows you to set whether to contact the recipient when the pre-alarm threshold is exceeded;
- “Active Thr.2 (Alarm)”: allows you to set whether to contact the recipient when the alarm threshold is exceeded;
- Number identifies the number of the recipient to be contacted by message.

Alarms and pre-alarms are identified by indicating the phone number to which threshold exceedance notifications are sent.

You can add up to 15 contacts that will be notified directly via sms from the control unit. These sms will be subtracted from the total sms available per sim.

You can select whether to contact numbers only for exceeding: alarm, pre-alarm, both items or no case; by writing “1” (enabled) or “0” (disabled), in the box below the items: “Active Thr.1 (Pre-alarm)” and “Active Thr.2 (Alarm).”

Alarm notifications

Text message alert

Home > Alarms > Alarms Notifications

SMS Thr.1
(Preallarme)

Attenzione: soglia di preallarme superata

Read Save

SMS Thr.2
(Allarme)

Attenzione: soglia di ALLARME superata

Read Save

From the “Alarms” section by clicking on “Alarms Notification” the previous screen appears, set as follows:

- SMS Thr.1 (Pre-alarm): is the box used to fill in the message that is sent in the hypothesis that the pre-alarm threshold is exceeded.
- SMS Thr.2 (Alarm): this is the box used to fill in the message that is sent in the event that the alarm threshold is exceeded.

“Read” and “Save” buttons are provided for both panes.

“Read” provides for printing the last modified saved in the pane on the screen.

“Save” provides for saving the changes made to the message contained in the pane.

Alarm customization

[Home](#) > [Alarms](#) > Local Alarms

Local Alarm Duration (sec)	5
Local Alarm Thr. 1 (Preallarme)	☒ Local OUT1
Local Alarm Thr. 2 (Allarme)	☒ Local OUT2

From the “Alarms” screen by clicking “Local Alams” you can customize the alarm settings.

The screen is set up like this::

- “Local Alarm Duration”: allows you to change the operating time of the siren present in the control unit;
- “Local Alarm Thr.1 (Prealarm)”: is a checkable item that enables/disables the sending of messages when the prealarm threshold is exceeded;
- “Local Alarm Thr.2 (Alarm)”: is a checkable item that enables/disables the sending of messages if the alarm threshold is exceeded.

At the bottom of the page are the “Read” and “Save” buttons.
“Read” provides for printing the last saved edit on the screen.
“Save” provides for saving the changes made to the page.

Readings

Reading digital chains

Digital Chain #1

Item	Y	X	T	Z
Probe 01	98.000	98.000	98.000	98.000

☐ Continuous Reading

From the “Home” selecting “Digital Chain #1” will take you to this screen divided into 5 columns:

- “Item”: identifies the measuring probe present on the chain;
- “Y”: indicates the inclination value of the probe with respect to the Y axis;
- “X”: indicates the inclination value of the probe with respect to the X axis;
- “T”: indicates the temperature of the probe;
- “Z”: indicates settling (only for instruments that require it).

Depending on the number of probes it will print the 4 corresponding parameters on the screen.

Clicking “Continuos Reading” D4000 will start reading the values of the probes from the first to the last, starting over at the end of reading all of them.

Selecting “Digital Chain #2” will open an equal screen, related to the second digital inclinometer chain, which will have for “Item” number the number of probes corresponding to the second digital chain.

Reading analog channels on the MUX

Home > MUX Choice

Please choose channels to read:

MUX 0 | MUX 1 |

From the “Home” screen by clicking “Mux choice” you will choose which multiplexer to set.
The first will correspond to 0 and the others to progressive numbers up to 7.
The D4000 reads a maximum of 8 Muxes of 16 channels each for a total of 128 analog channels.

Mux Reading

Analog Channels		
#	Ch. Name	Value
000	A	0.000
001	B	0.000
002	C	0.000
003	D	0.000
004	E	0.000
005	F	0.000
006	G	0.000
007	H	0.000
008	I	0.000
009	J	0.000
010	K	0.000
011	L	0.000
012	M	0.000
013	N	0.000
014	O	0.000
015	P	0.000
Read Next Channel		
☐ Continuous Reading		
☐ Read VW Temperatures		

From the “Home” selecting “Analog Channels” and then selecting the Mux will take you to the screen dedicated to the corresponding analog channels.

- “Continuos Reading” allows the device to start continuously reading the sensors, starting over once it reaches the last one;
- “Read VW Temperatures” reads only the temperatures of the vibrating chord channels.