Connectivity

the evolution

User Manual

For

XDFN RACK MODULE

Eproms RKM - RKE

Microface E 24VAC

&

Hiromatic E

Code 273111 rev. 29.08.2006

INDEX

1 Introduction

1.1 Foreword

This User Manual describes the Microface E Control System. It contains information concerning the architectures of the control systems.
In the following sections first the Hardware, and later the Software (Firmware) are explained in detail.
In case of Remote control system only the SNMP is allowed from Microface E and, the related TRAPS identification, are available on SNMP Control manual cod 272703 rev. 31.03.06 or higher

2 Hardware

2.1 Microface Evolution 24V AC

The Microface Evolution is a microprocessor-based electronic card, which is able to manage the devices and the sensors installed in the unit
Microface E is installed in the electrical panel of indoor-units together with a User-interface module ("LCD Display"), which allows to read/set/reset values, parameters and alarms.
To get access to the Microface E connections and Jumpers the LCD Display (if present) has to be removed from its 4 mounting pins.
As the Microface E is the "Heart" of the System, which controls all Functions of the Unit, the Jumpers have to be set in order to set-up the control board according to the requested functions; all jumpers are normally set in the factory as described on the table below.
The meaning of Input and Outputs are available at Connection Guide chapter included inside this manual

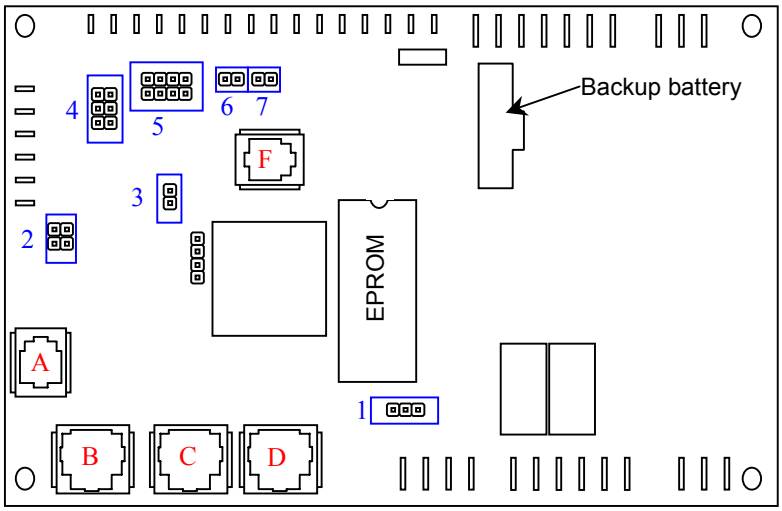


Figure 1 – Microface E 24V AC with connectors and jumpers.

Identification	Explanation
1	This Jumpers block is used to define the size of Eprom: Up to 2Mbit = □■ Up to 4mbit = ■■□ (Factory Setting)
2	Sub Group Unit setting: not used, no jumpers set
3	External Access: Never remove this Jumper
4	Analog Input Jumper Block: Not Used
5	Microface ID Jumpers block: see chapter 2.2
6	EEprom Writing Enabled: Enabled = ■ (Factory Setting; never remove the jumper) Disabled =□□
7	Not Used
A	RS 485 connector for HiSNMP
B	Hirobus Slave 8 poles connector for Remote Display
C	Hirobus Slave 8 poles for Hirobus LAN
D	Hirobus Master 8 poles connector for Hiromatic E
F	I^2C connector for Local Display

2.2 Connection between Microfaces

When Microfaces are connected with HIROBUS, it is necessary to assign a different address to each of them by the Microface E ID jumpers block (see also chapter 2.1) as shown in the figure below:

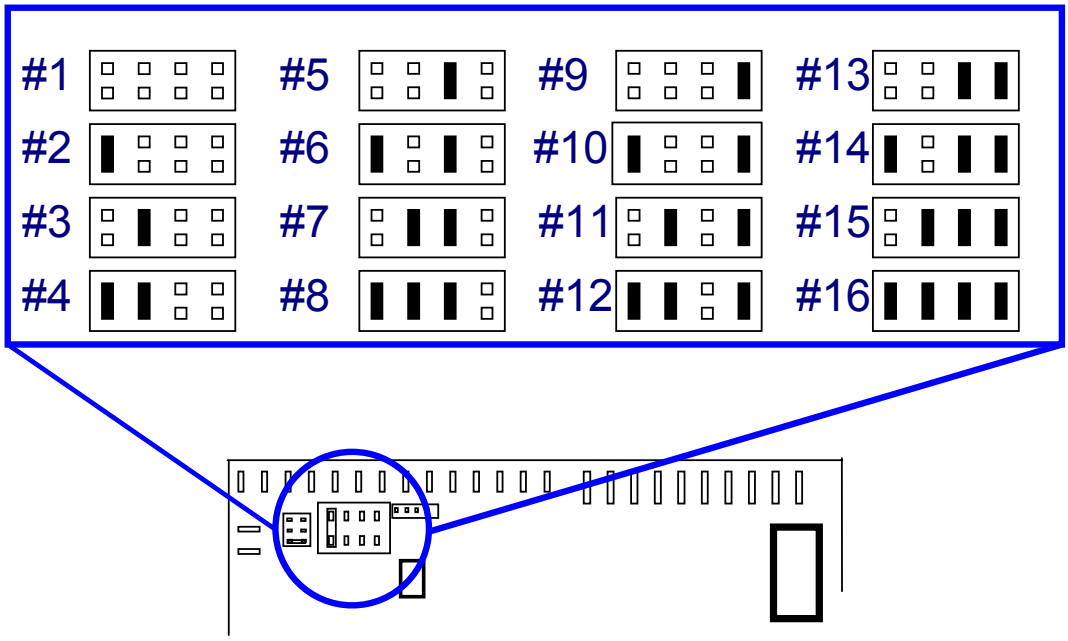
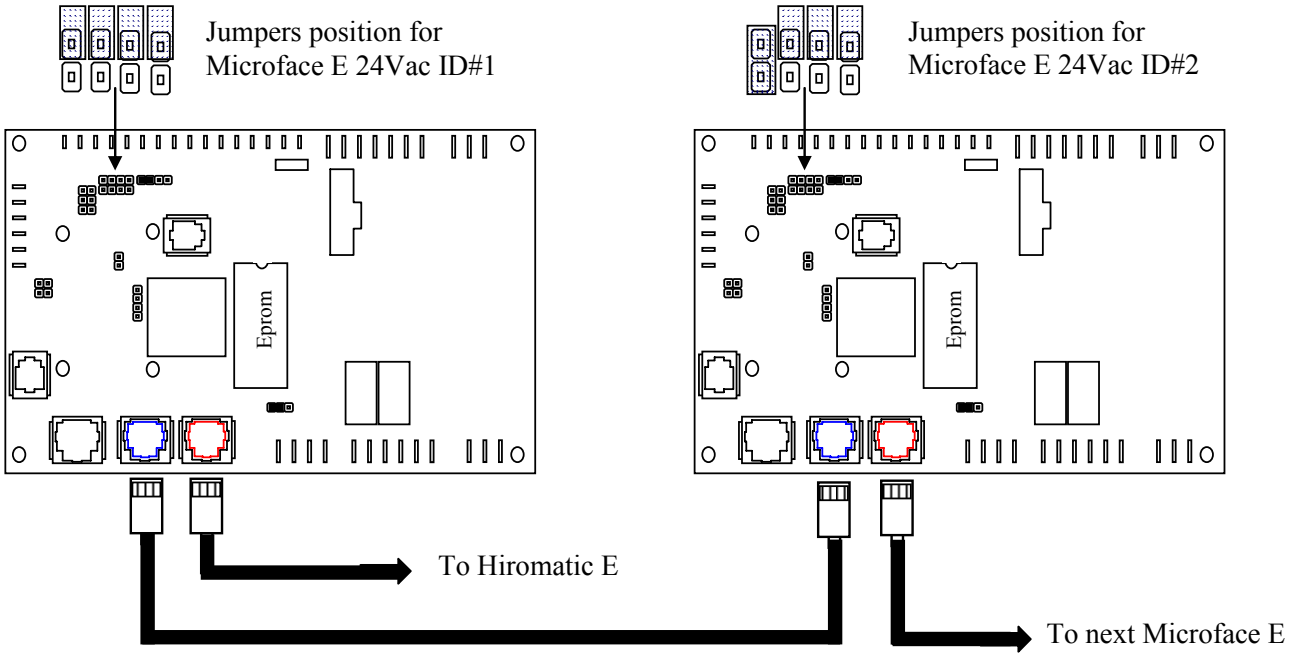


Figure 2 – Microface E ID # jumpers block



- To Hiromatic E with 8 poles Hirobus screened cable
- From Unit to Unit with 6 poles Hirobus screened cable

Figure 3 – Example of two Microfaces E connected via HIROBUS

2.3 LCD Display

There are two different Displays available:
“Local” Display
“Remote” Display

Both Displays have the same Front-View:

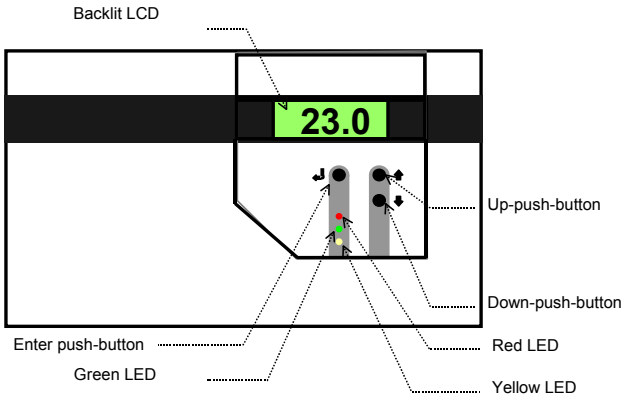


Figure 4 – LCD Display Front View (with plastic cover)

Just the backside connections are different, because of the different connection types to the Microface E: Local or Remote Display.

CONNECTION TYPE A:
4 wires flat cable
(410 mm max. length)

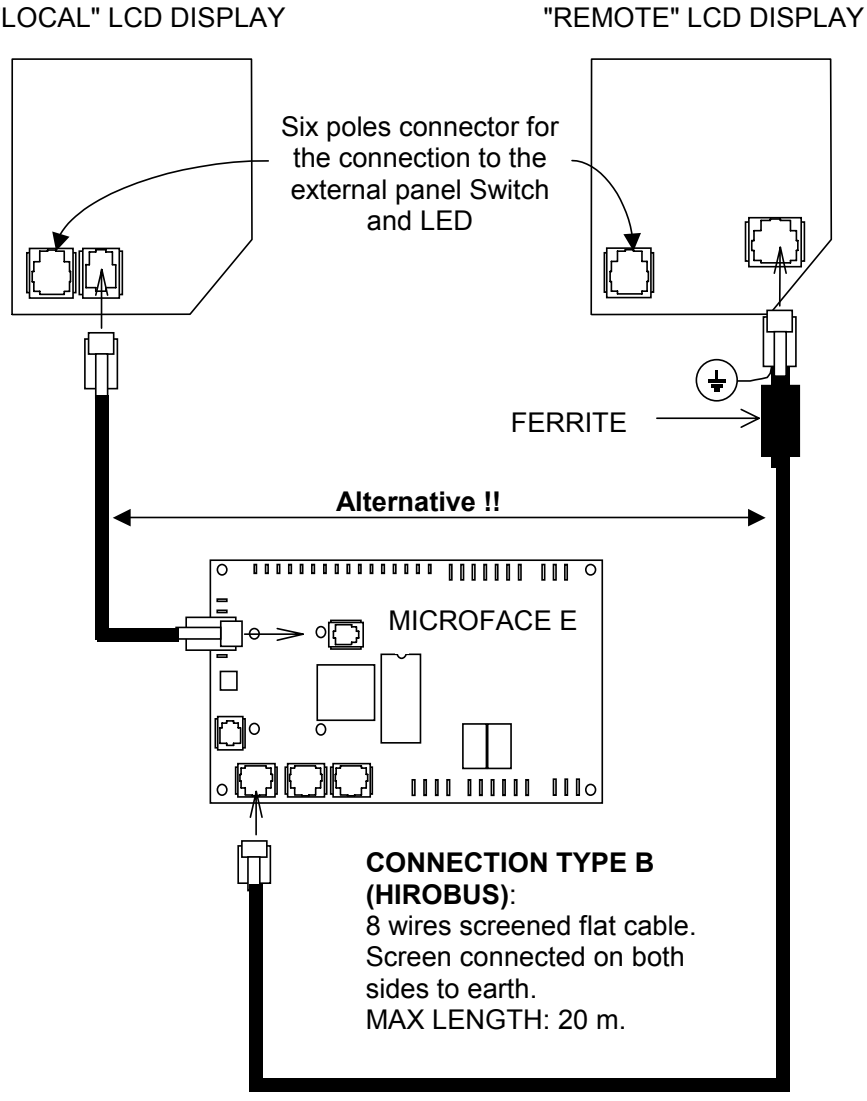


Figure 5 – Local and Remote Display Backside

Never use cables longer than 410 mm (Local Display) or longer than 20m (Remote Display)!

2.4 Eprom

The Eprom is the device, which stores the Program; the Microface has to work with. It doesn't store any user-settings; this is done by the Microface itself (in the RAM and the E^2Prom). The Version Name and the Number are printed on the Label of the Eprom.
The following Eproms are today in use for Standard Rack unit (the *.* is a placeholder for the actual Version):

RKM-1.60*.* 4 Mbit Flash for Microface E 24Vac
RKE-1.60*.* 4 Mbit Flash, for Hiromatic E.

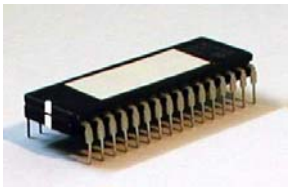


Figure 6 - Eprom

Un-power the Microface before mounting/dismounting the Eprom. Remove Eprom only with special tool; never use a screwdriver. For correct direction of mounting please refer to Figure 1 in chapter 2.1 for Microface E and Figure 8 in Chapter 2.6.2 for Hiromatic E. Compare the Mark in the Eprom with the direction in the Drawing.

2.5 PTC Temperature Sensor

The PTC Sensor is temperature-sensors, changing the resistance according to the temperature (positive temperature coefficient). The connection is 2 poles. The length of the cable for the sensor ranges from 2 to 10 meters. It is used to monitor the inlet and outlet temperatures of the rack.

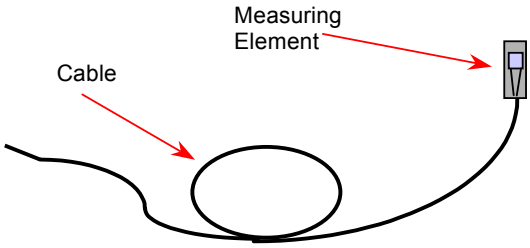


Figure 7 – PTC Sensor

2.6 Hiromatic E

Hiromatic E is a microprocessor-based electronic device, which makes possible to control the functions of the Microface devices. Hiromatic E offers numerous advantages of programming the units as well as to optimise their operation using various features see chapter 3, Software.

2.6.1 Hiromatic E direct Connection to Microface E

Hiromatic E can be fixed on the front panel of the unit, simply connecting the HIROBUS cable

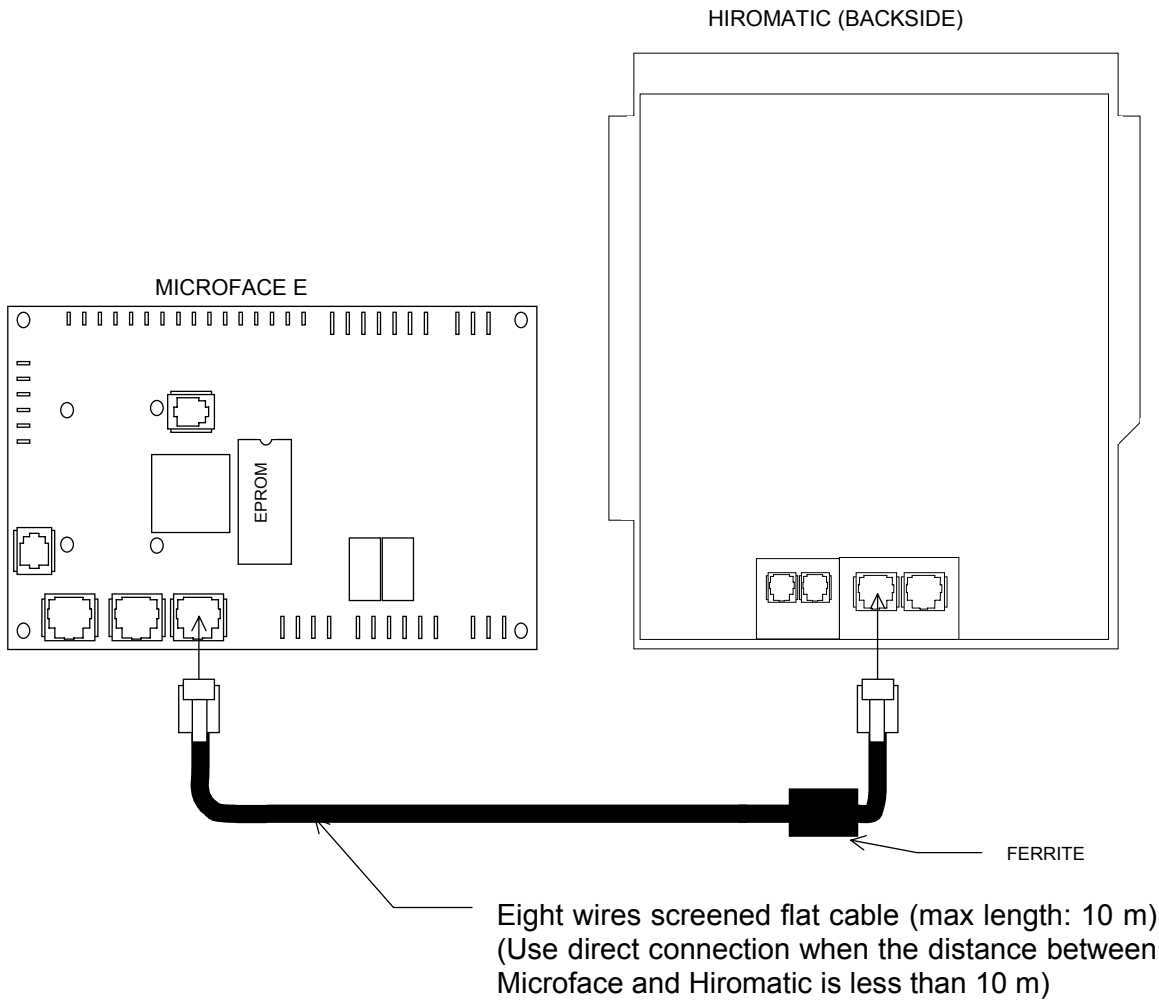


Figure 8 – direct Connection between Microface E and Hiromatic E

2.6.2 Hiromatic E Backside View, Jumpers and Eprom Position

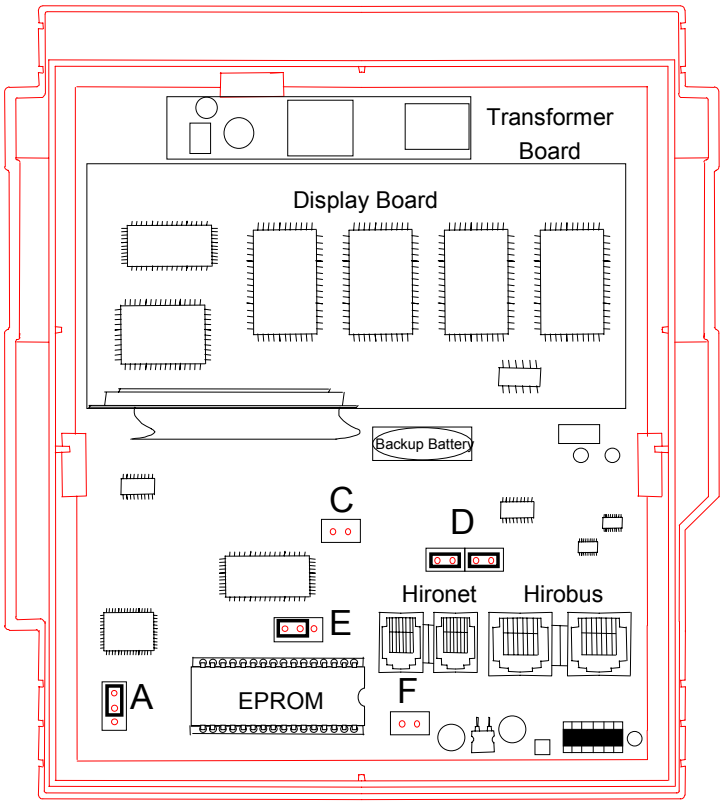


Figure 9 – Hiromatic Evolution Backside

Description of the Jumpers:

A:	Eprom (2M) / Flash Size (4M):	Middle + Upper Jumper: 2 or 4 MBit (std. setting) Middle + Lower Jumper: not used.
C:	Write Disabling:	do not set this Jumper
D:	Interface Selection:	both Jumpers as indicated in Drawing: RS 485 (std. setting) No Jumpers set: RS 422
E:	Contrast Selection:	Middle + Left Jumper: Variable Contrast Middle + Right Jumper: Fixed Contrast
F:	Flash download:	not supported yet. Do not set this Jumper

Please take special care about the Jumpers when installing a new (Spare Part) Hiromatic!

2.7 Power Supply Module for Hiromatic (24V only)

2.7.1 PSM Hardware

Hiromatic E can be supplied mounted in an independent electrical panel containing a power supply module as well (PSM Power Supply Module), if the Distance to the next Microface E is more than 10 meters. The PSM Module itself needs a power of 24V AC or 24V DC.

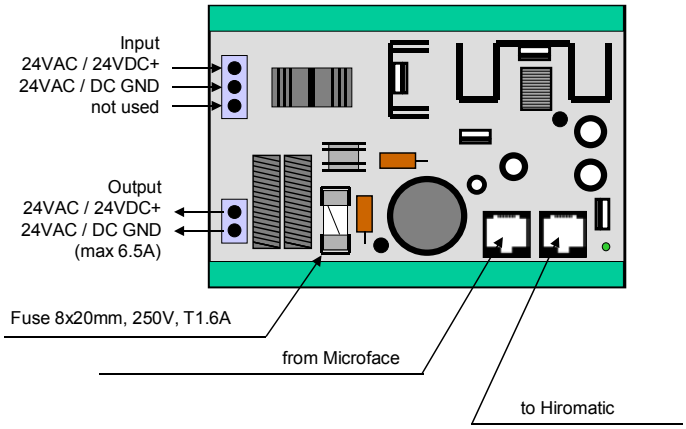


Figure 10 – PSM Module

2.7.2 PSM Connection (24V only)

The connection between Hiromatic E and the PSM is carried out in the factory by means of an eight wires HIROBUS cable. The PSM should be connected to Microface E through a six wires screened HIROBUS cable; the screen needs to be grounded in both terminals.

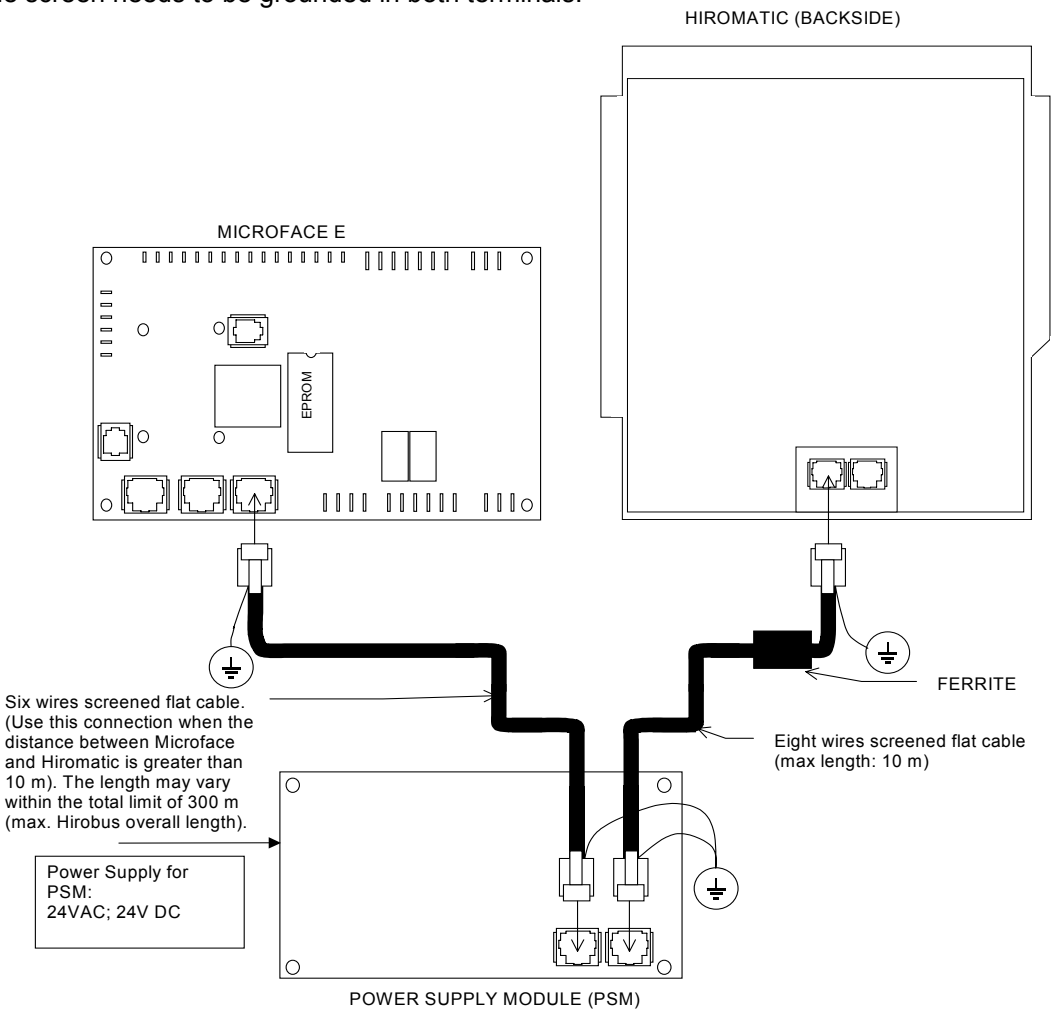


Figure 11 - Connection of Microface E LAN to Hiromatic E with PSM.

2.8 Hirobus Cables and other Connection Cables

The connections between Microface E, Hiromatic E, display are carried out with cables having a different number of wires and different connectors. Following you can find how these cables have to be done. For the type of cable and connectors refer to the spare part list included in this manual.

Please note that a wrong connection could cause serious problems to the electronic devices (Microface and Hiromatic); for this reason we strongly recommend to use only first quality products or to buy the cables directly from your sales reps..

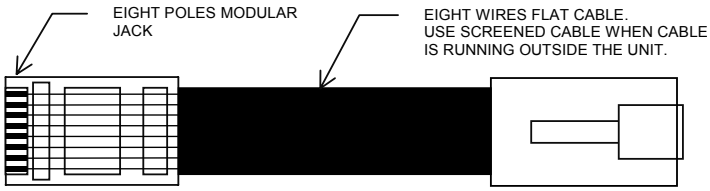


Figure 12 - Eight-wires; eight poles connector HIROBUS cable, for Hiromatic E and remote Display connections

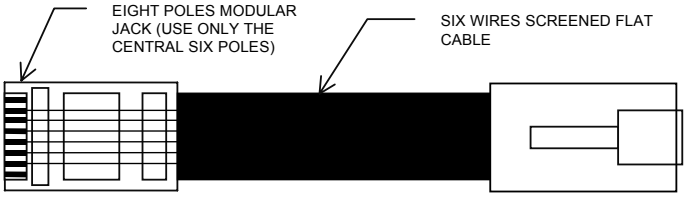


Figure 13 - Six-wires eight poles connectors (Pin 1 and 8 not connected) HIROBUS cable, for Microface E and PSM, connection. This cable must be screened.

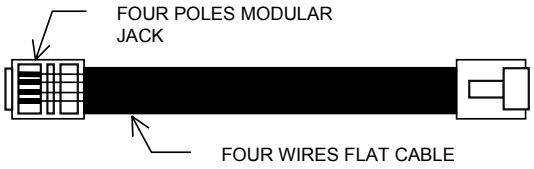


Figure 14 - 4 wires flat cable for local LCD Display, four poles connectors.

2.9 Hardware, Technical Specification

MICROFACE E 24V AC	
Power Supply	24VAC, ± 10%; 50 Hz
Digital Out (Triac)	7
Digital Out (Relay)	2 (max. 24V – 1A)
Analogue Out (0-10V)	2
Analogue In (resistive)	8
Analogue In (resistive / 0-10VDC)	3
Storage Temperature	-10 (not condensing) to +65°C
Operating Temperature Range	0 (not condensing) to +55°C
PTC Temperature sensor	
Cable length	1,5 m and 10m
Temperature range	-28 to 100°C
Point of calibration	2000Ω at 25.0°C
Hiromatic E	
Power Supply	10VDC (from Hirobus)
Graphic Display	Backlit, 200 x 64 pixels
Mounting hole	175 x 150mm
Power Supply Module (PSM)	
Power supply	24VAC, ± 10%; 24VDC, ± 20%
Output	10VDC (Hirobus, stabilised); 24VAC, ± 10%; 24VDC, ± 20% (filtered)

2.10 Spare Parts List

DESCRIPTION	**CODE**
Switch + Led	255039
Microface E (Evolution) 24 AC board	275297
Local LCD display for Microface	275098
Remote LCD display for Microface	275662
Probe temperature PTC	275183
Probe PTC 2 kohm L = 10 m	275155
EPROM Microface E RKM-160*.*	276226
EPROM Hiromatic E RKE-160*.*	276227
Hiromatic Evolution	275691
Flat cable 8 way M-M L = 1 m	275607
Flat cable 8 way M-M L = 10 m	275610
Flat cable 8 way screened (specify length)	275626
Module PSM 24/24-10 for Hiromatic	275316
Plastic holder for Microface only	270002
Plastic holder for Microface and LCD display	270003
Hirobus / Hironet Cable Tester	480061
Hirobus / Hironet Interface Tester	480060

3 Software

3.1 The LCD Display

The interface module consists of a backlight LCD and of three push buttons that permit an easy access to the unit parameters.

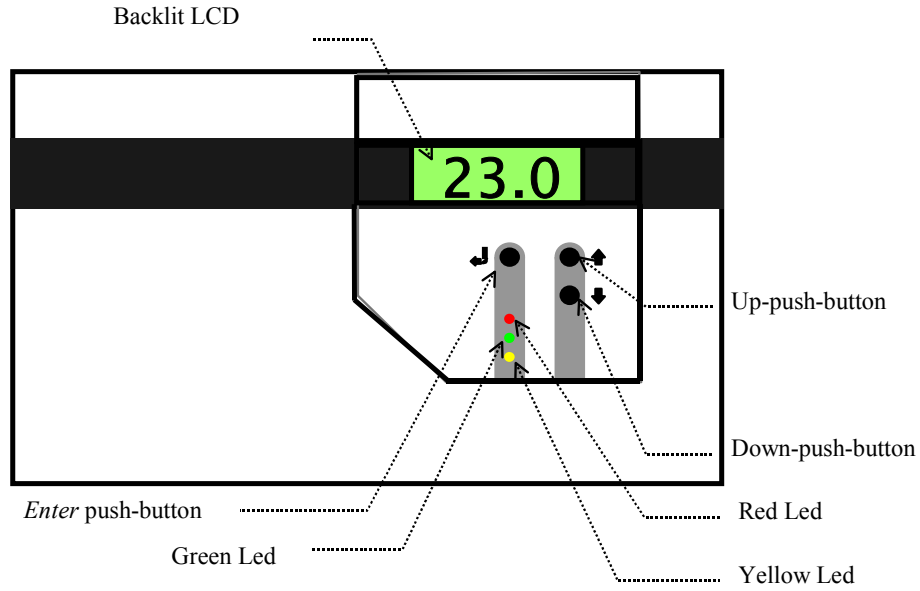
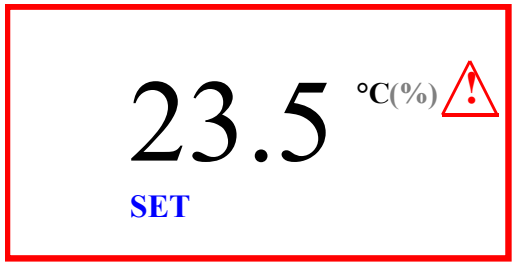


Figure 15 - Interface module between Microface and operator (front view).

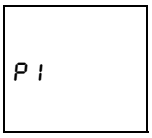
There are three LED's: the yellow Led to indicate the unit is power supplied, the green one lights up when the unit is in operation and the red one signals either an alarm or a warning condition.
On the LCD the following symbols will be displayed:

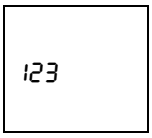


⚠	The alarm triangle is ON when either a warning or an alarm is active.
SET	The 'SET' string confirms the full access to the displayed parameters.
°C	The „°C" string appears when temperature is displayed on the LCD.

3.1.1 How to move through the Values/Parameters of the LCD Display

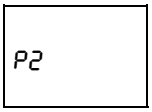
All Values and Parameters are listed up just one after the other. To jump the next parameter, simply the “down” button has to be pressed.

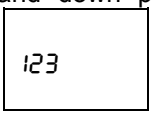




The name of the first parameter (*P 1* is not a real parameter, but only an example) will be displayed for one second, while the value itself will be displayed for two seconds (alternating) (this position is also considered as the “Home”.

“Up” and “down” push-buttons





The name of the second parameter (*P2* is not a real parameter, but only an example) will be displayed for one second, while the value itself will be displayed for two seconds (alternating).

“Up” and “down” push buttons to reach the other parameters.

3.1.2 How to change Parameters

To change the value of a parameter scroll the list using the “up” and “down” push-buttons until the desired parameter is displayed and press “Enter” (↵). By pressing the “up” and “down” push buttons, it is possible to change the corresponding value; after having obtained the required value, press enter (↵) again. The display will show again the name of the parameter alternating with the new value.

3.1.3 How to reset Alarms or Warnings

When an alarm is triggered, the red alarm LED is lit on the LCD Display Module and the corresponding symbol is shown in the Display.
The Alarm section can be reached by pressing the “up” push-button when the first parameter is on the display; alarms are pointed out according to their code order.
After having entered the alarm section, the alarm code is displayed and every second the code is replaced by the coded description.
Pressing the “Enter” key (↵), when an alarm code is displayed on the LCD, all the active alarms will be reset. After the reset operation, all the still active alarms will be shown again. If there are no more active alarms, the first parameter / value of the list will be displayed again.

3.1.4 Tricks

To quickly reach the parameter at the bottom of the list, press “Enter” (↵) together with the “down” push-button. To quickly reach the parameter at the top of the list, press “Enter” (↵) together with the “up” push-button.

3.2 The LCD Parameters

LCD	Description	Range	Res.	Standard Value
t in	Inlet Temperature: this is the average of the 2 inlet sensors temperature values.	Read Only	0.1 (°C)	--
tou	Outlet Temperature: this is the actual outlet temperature value	Read Only	0.1 (°C)	--
Ht 1	High Inlet Temperature Level 1: this parameter allows defining the maximum inlet temperature value; over this limit the related warning (HI 1) will be activated. The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°C)	34
Ht2	High Inlet Temperature Level 2: this parameter allows defining the maximum inlet temperature value; over this limit the related alarm (HI2) will be activated. The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°C)	39
Ht3	High Inlet Temperature Level 3: this parameter allows defining the maximum inlet temperature value; over this limit the related alarm (HI3) will be activated. The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°C)	45
Ht4	High Outlet Temperature Level 1: this parameter allows defining the maximum outlet temperature value; over this limit the related warning (HO 1) will be activated. The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°C)	50
Ht5	High Outlet Temperature Level 2: this parameter allows defining the maximum outlet temperature value; over this limit the related alarm (HO2) will be activated. The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°C)	60
Ht6	High Outlet Temperature Level 3: this parameter allows defining the maximum outlet temperature value; over this limit the related alarm (HO3) will be activated. The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°C)	70
Ht7	High Delta Temperature Level 1: this parameter allows defining the maximum delta T between Outlet and Inlet, over this limit the related warning (Hd 1) is activated The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°K)	30
Ht8	High Delta Temperature Level 2: this parameter allows defining the maximum delta T between Outlet and Inlet, over this limit the related alarm (Hd2) is activated The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°K)	40
Ht9	High Delta Temperature Level 3: this parameter allows defining the maximum delta T between Outlet and Inlet, over this limit the related alarm (Hd3) is activated The event is not considered for a time of 5 minutes at each unit ON then the condition have to persist for 25 seconds	No, 1 – 99	1 (°K)	60
id 1	IP Address 1 for SNMP protocol	0 – 255	1	
id2	IP Address 2 for SNMP protocol	0 – 255	1	
id3	IP Address 3 for SNMP protocol	0 – 255	1	
id4	IP Address 4 for SNMP protocol	0 – 255	1	
idP	Listen Port Address for SNMP protocol	0 – 2000	1	
Std	Standard Settings: forcing to YES all parameters will be set according to the standard factory settings. The parameter changes automatically to no as soon as the value of one parameter is modified	No, Yes	-	
CA 1	Calibration of Inlet Temperature Sensor (SX)	-9.9 - +9.9	0.1 (°C)	
CA2	Calibration of Inlet Temperature Sensor (DX)	-9.9 - +9.9	0.1 (°C)	
CA3	Calibration of Outlet Temperature Sensor	-9.9 - +9.9	0.1 (°C)	

3.2.1 The Warnings and Alarms table

Number	LCD code	Hiromatic E description	Type
003	Hd3	High Delta Temperature Level 3	Alarm: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 4. (Manual Reset)
006	Hd 1	High Delta Temperature Level 1	Warning: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 3. (Auto-reset)
007	Hd2	High Delta Temperature Level 2	Alarm: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 3. (Manual Reset)
008	SL2	Smoke Alarm	Alarm: the event is activated if the unit is ON and the input 3 is open for 5 seconds minimum. (Auto-reset)
009	rdo	Rear Door Open	Warning: the event is activated if the unit is ON and the input 1 is open for 5 seconds minimum. This event actives the Output 2. (Auto-reset)
0 10	Fdo	Front Door Open	Warning: the event is activated if the unit is ON and the input 0 is open for 5 seconds minimum. This event actives the Output 2. (Auto-reset)
0 12	bCo	Backup Cooling Active	Alarm: the event is activated if the unit is ON and the Input 5 is open; This event actives the Output 1. (Auto-reset)
0 15	FdF	Fire Detection Failure	Warning: the event is activated if the unit is ON and the input 6 is open for 5 seconds minimum. (Auto-reset)
0 18	HO 1	High Outlet Temperature level 1	Warning: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 3. (Auto-reset)
0 19	HO2	High Outlet Temperature Level 2	Alarm: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 3. (Manual Reset)
022	HI 1	High Inlet Temperature Level 1	Warning: the event is ignored for 5 minutes at each Unit ON then if the limit set is reached, the event will be activated with a delay of 25 seconds. (Auto-reset)
023	HI2	High Inlet Temperature Level 2	Alarm: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 3. (Manual Reset)
024	HI3	High Inlet Temperature Level 3	Alarm: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 4. (Manual Reset)
025	HO3	High Outlet Temperature Level 3	Alarm: the event is ignored for 5 minutes at each Unit ON then the condition has to persist for 25 seconds. This event actives the Output 4. (Manual Reset)
029	oSF	Outlet Sensor Failure	Warning: the event is activated with a delay of 10 seconds without any influence from the status of the unit. (Auto-reset)
06 1	ISF	Inlet SX Sensor Failure	Warning: the event is activated with a delay of 10 seconds without any influence from the status of the unit. (Auto-reset)
062	ISF	Inlet DX Sensor Failure	Warning: the event is activated with a delay of 10 seconds without any influence from the status of the unit. (Auto-reset)
065	SL 1	Smoke Warning	Warning: the event is activated if the unit is ON and the input 2 is open for 5 seconds minimum. (Auto-reset)
073	F ir	Fire Alarm	Alarm: the event is activated if the unit is ON and the input 4 is open for 5 seconds minimum. This event actives the Outputs 0 and 7. (Auto-reset)

14

3.3 Hiromatic E

3.3.1 Layout

The front panel of Hiromatic E consists of a backlight graphic LCD, of eight push buttons that permit input function and of two LED.

Cursor Buttons: to move inside the Menu; Up and Down to go to the next or previous window

Push-button to start/stop the unit

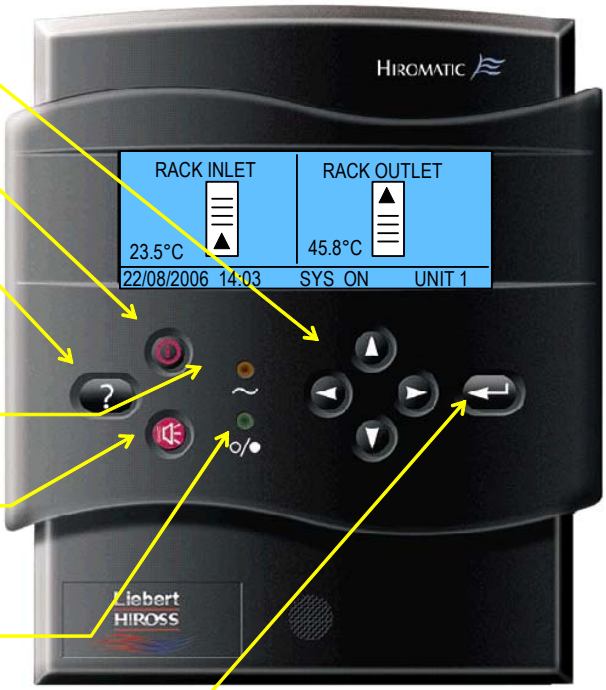
Help Key: not used

This LED (orange) will be ON when the unit is power supplied

Alarms and warnings reset.

GREEN when the Unit is in Operation,
YELLOW if the Units is in Warning condition,
RED if the Unit is in Alarm condition

ENTER Button, to set Parameters



15

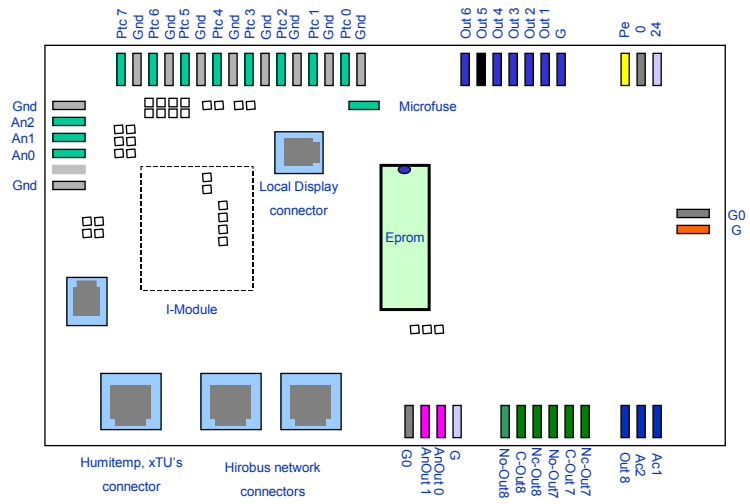
3.3.2 Hiromatic E Windows

PAGE	DESCRIPTION
RACK INLET  20.0°C RACK OUTLET  35.0°C 22/08/2006 14:03 SYSTEM	On the System page the actual average temperatures value is displayed. Press Down key for next page or Left / Right key to view the next unit
RACK INLET  20.0°C RACK OUTLET  35.0°C 22/08/2006 14:03 SYS OFF UNIT 1	On the Unit page the actual temperatures are displayed. Press Down key for next page or Left / Right key to view the next unit
INPUTS STATUS **UNIT 1** REAR DOOR STATUS CLOSED FRONT DOOR STATUS CLOSED SMOKE WARNING OK OK SKOKE ALARM OK FIRE ALARM OK EXT.FIRE DETECTION ENABLED BACKUP COOLING OFF	The inputs status page shows the status of each input managed by the Microface E board Press Down key for next page or Left / Right key to view the next unit
OUTPUTS STATUS **UNIT 1** BACKUP COOLING OFF AUTO REMOTE UNIT STATUS OFF AUTO EXT.FIRE DETECTION ENABLED AUTO HIGH TEMP. OR D.T 1/2. OK AUTO HIGH TEMP. OR D.T 3 OK AUTO	The outputs status page shows the actual output status of Microface E board. It is possible also to force each output easily selecting the parameter and change the AUTO string to MANUAL; the related output in this case is forced to ON Press Down key for next page or Left / Right key to view the next unit
TEMPERATURE WARNINGS 1/2 **UNIT 1** HIGH OUTLET TEMPERATURE 1 50°C HIGH OUTLET TEMPERATURE 2 60°C HIGH OUTLET TEMPERATURE 3 70°C HIGH INLET TEMPERATURE 1 34°C HIGH INLET TEMPERATURE 2 39°K HIGH INLET TEMPERATURE 3 45°C	The parameters included on this page allow defining the high inlet and outlet temperature limit value. Press Down key for next page or Left / Right key to view the next unit
TEMPERATURE WARNINGS 1/2 **UNIT 1** HIGH DELTA TEMPERATURE 1 50°C HIGH DELTA TEMPERATURE 2 60°C HIGH DELTA TEMPERATURE 3 70°C	The parameters included on this page allow defining the high delta temperature limit value. Press Down key for next page or Left / Right key to view the next unit

PAGE	DESCRIPTION
HIROMATIC SETTINGS 1/2 **SYSTEM** PIEZO FEQUENCYOFF / 2.0 LISTEN PORT LANGUAGE ENGLISH DATE / TIME MO 21/11/2005 16:30 CONTRAST 220 BACKLIGHT OFF AFTER 5 min HIROMATIC ID/NUM. OF UNITS 1 / 1 COMM. ENABLED READ/WRITE	On this page is possible to configure the Hiromatic E as well as the Number of units in Hirobus Network and to enable the communication type. Press Down key for next page
HIROMATIC SETTINGS 2/2 **UNIT 1** IP ADDRESS 129.100.19.165 LISTEN PORT 150 STANDARD SETTING YES HM. ON/OFF ENABLED YES	On this page is possible to configure the IP address for SNMP protocol communication and to restore the factory parameters settings as weel as to enabled or disable the Hiromatic On/Off key Press Down key for next page or Left / Right key to view the next unit
SENSORS CALIBRATION UNIT 1 ACTUAL OFFSET INLET TEMPERATURE SX 00.0 0.0 INLET TEMPERATURE DX 00.0 0.0 OUTLET TEMPERATURE 00.0 0.0	If required an offset of sensors mounted on board can be done. Press Down key for next page or Left / Right key to view the next unit
STATUS REPORT PAGE 1 **SYSTEM** (01) 21.11.2005 16:30 RESET HIGH OUTLET TEMPERATURE	On system status report page all events (up to 200; system and unit) are stored. Press Left or Right key for Status Report of Units This page is reachable from the main page easily pressing the Home key Press the Home key to back to the main page
STATUS REPORT PAGE 0 **UNIT 1** (01) 21.11.2005 16:30 RESET HIGH OUTLET TEMPERATURE	On unit status report page; the last 3 events are stored Press the Home key to back to the main page

4 Connection guide

Microface E (Layuot)



Inputs table

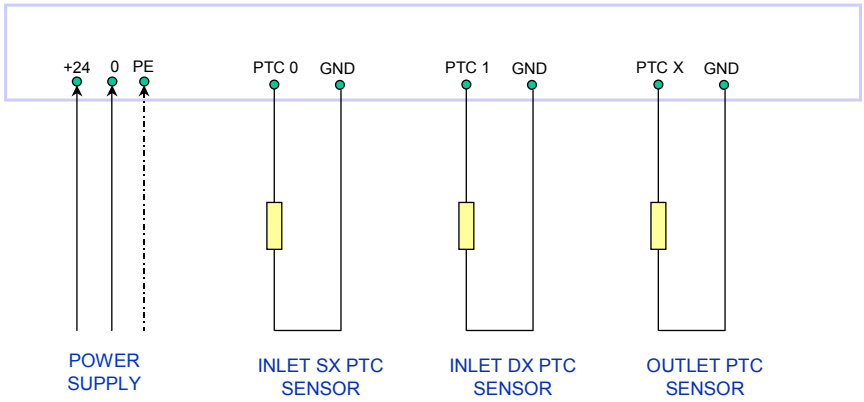
- Ptc 0 = Rack Sx Inlet Temperature
- Ptc 1 = Rack Dx Inlet Temperature
- Ptc 2 = Smoke Warning
- Ptc 3 = Smoke Alarm
- Ptc 4= Fire Alarm
- Ptc 5= Backup Cooling Active
- Ptc 6 = Fire Detection Device Faulire
- Ptc 7 = Rack Outlet Temperature
- Ana 0 = Rear Door Status
- Ana 1 = Front Door Status

18

Outputs table

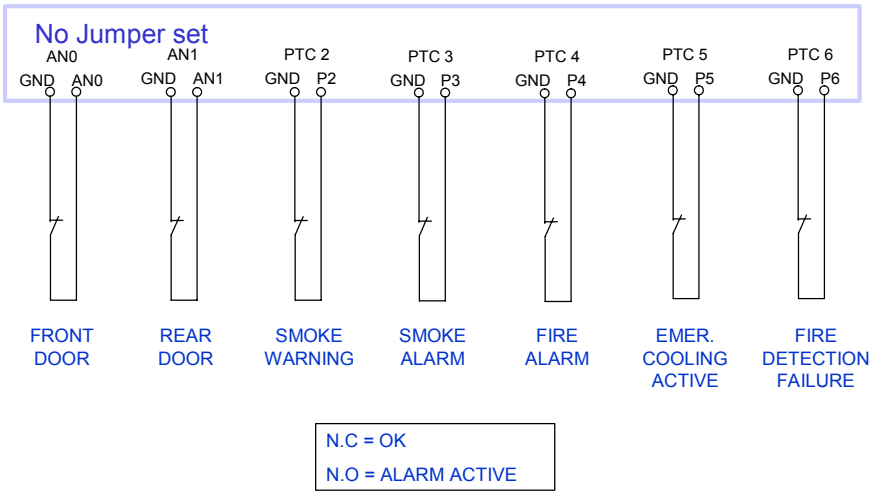
- Out 1 = Fan & Damper
- Out 2 = Fire Detection device Enable / Disable
- Out 3 = High Temperatures or Delta T level 1 - 2
- Out 4 = High Temperatures or Delta T level 3
- Out 0 = Remote Unit On Off
- Out 7 = Remote Unit On Off

Power supply &Sensors



19

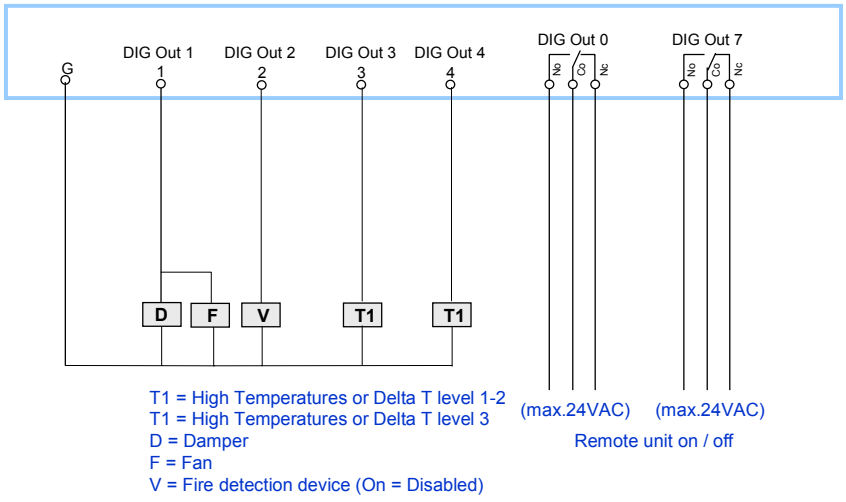
PTC & Analog inputs



N.C = OK

N.O = ALARM ACTIVE

Outputs



T1 = High Temperatures or Delta T level 1-2
T1 = High Temperatures or Delta T level 3
D = Damper
F = Fan
V = Fire detection device (On = Disabled)

(max.24VAC) (max.24VAC)

Remote unit on / off

20