Connectivity

the evolution

User Manual

Eproms RKM - RKE

Microface E 24VAC

&

Hiromatic E

Code 272111 rev. 12.12.2005

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. 12.12.05 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

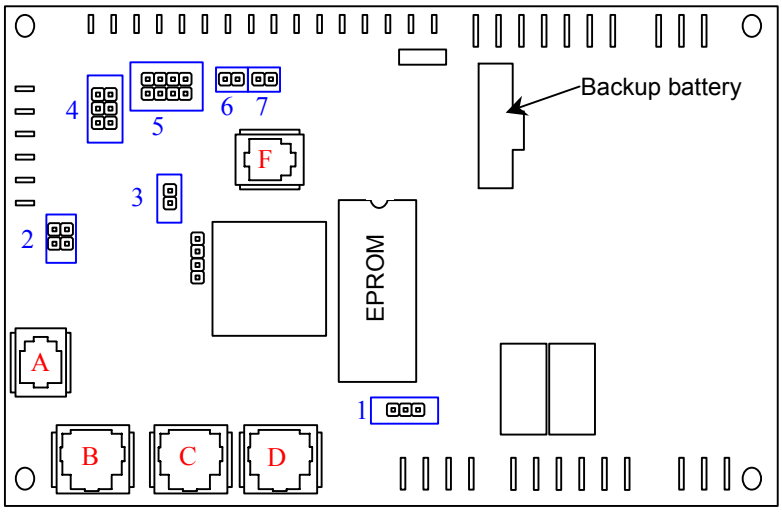

Figure 1 – Microface E 24V AC with connectors and jumpers.

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: Never Set these jumpers (Hirobus Network not available)
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	Not Used
D	Hirobus Master 8 poles connector for Hiromatic E
F	I^2C connector for Local Display

2.2 LCD Display

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

Both Displays have the same Front-View:

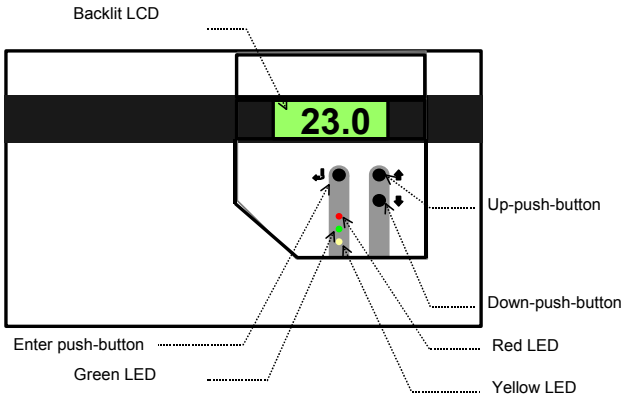

Figure 2 – LCD Display Front View (with plastic cover)

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)

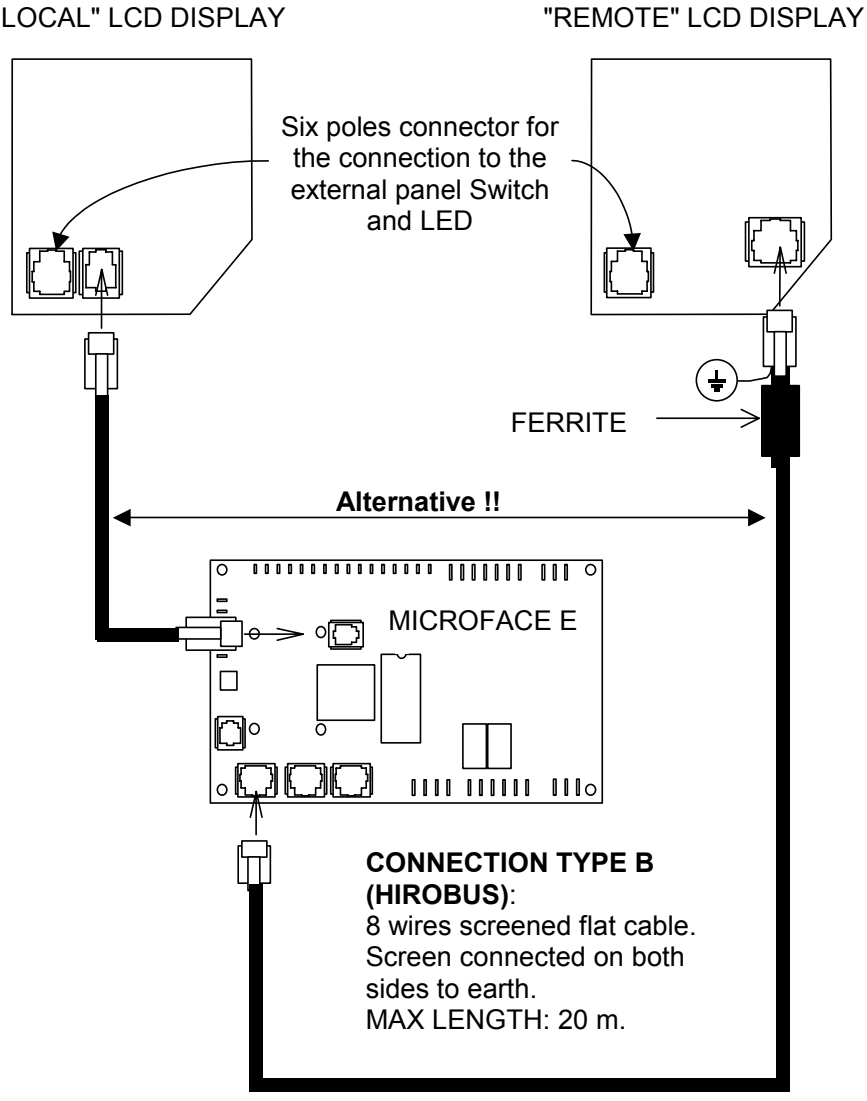

Figure 3 – Local and Remote Display Backside

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

2.3 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 24V Ac
RKE-1.60*.* 4 Mbit Flash, for Hiromatic E.

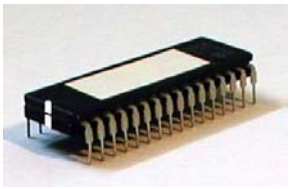

Figure 4 - Eprom

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, and Figure 8 in Chapter 2.6.2 for Hiromatic E. Compare the Mark in the Eprom with the direction in the Drawing.

2.4 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.

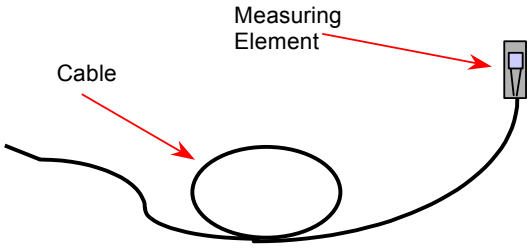

Figure 5 – PTC Sensor

2.5 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.

2.5.1 Hiromatic E direct Connection to Microface

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

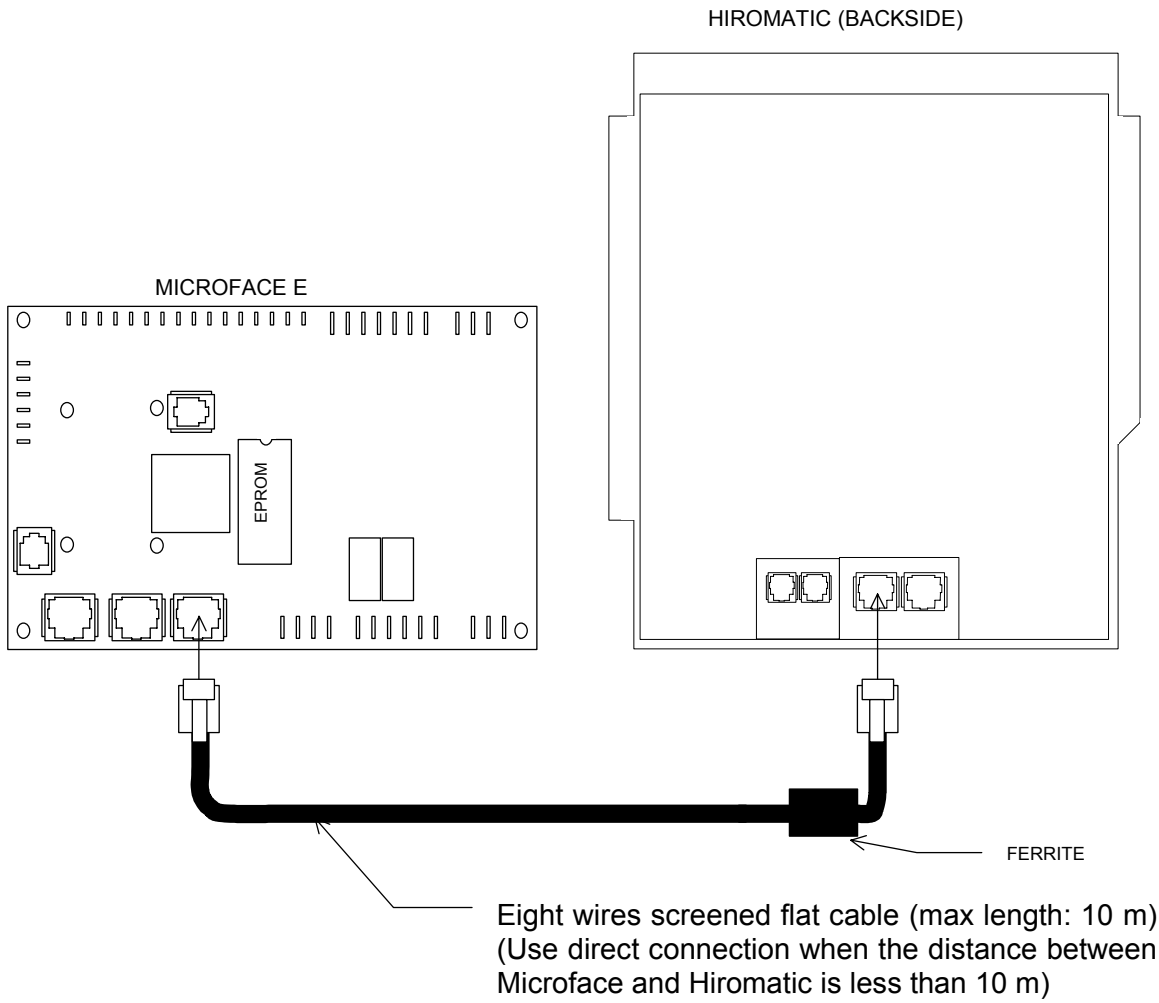

Figure 6 – direct Connection between Microface E and Hiromatic E

2.5.2 Hiromatic E Backside View, Jumpers and Eprom Position

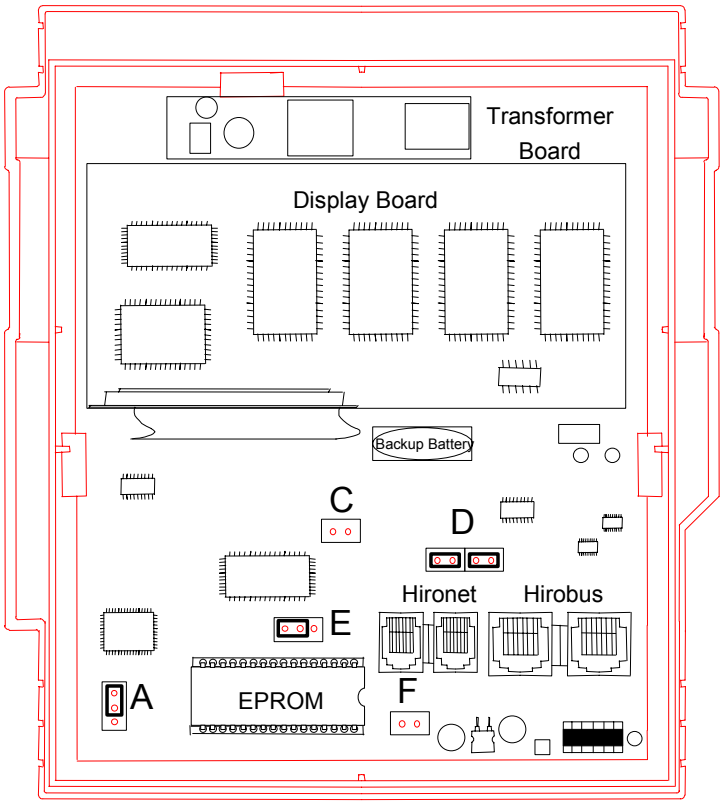

Figure 7– Hiromatic Evolution Backside

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!

2.6 Power Supply Module for Hiromatic (24V only)

2.6.1 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.

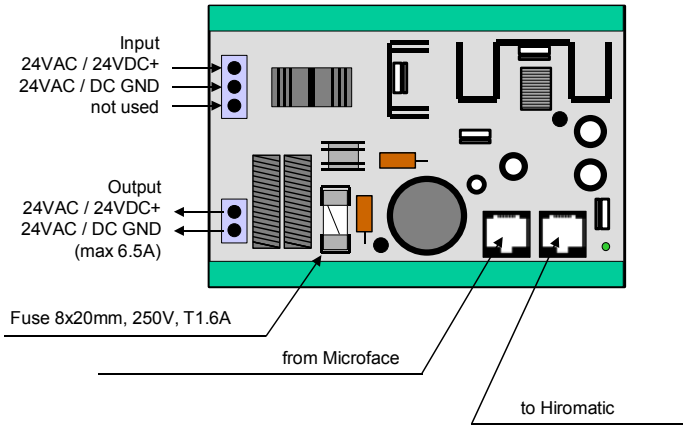

Figure 8 – PSM Module

2.6.2 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.

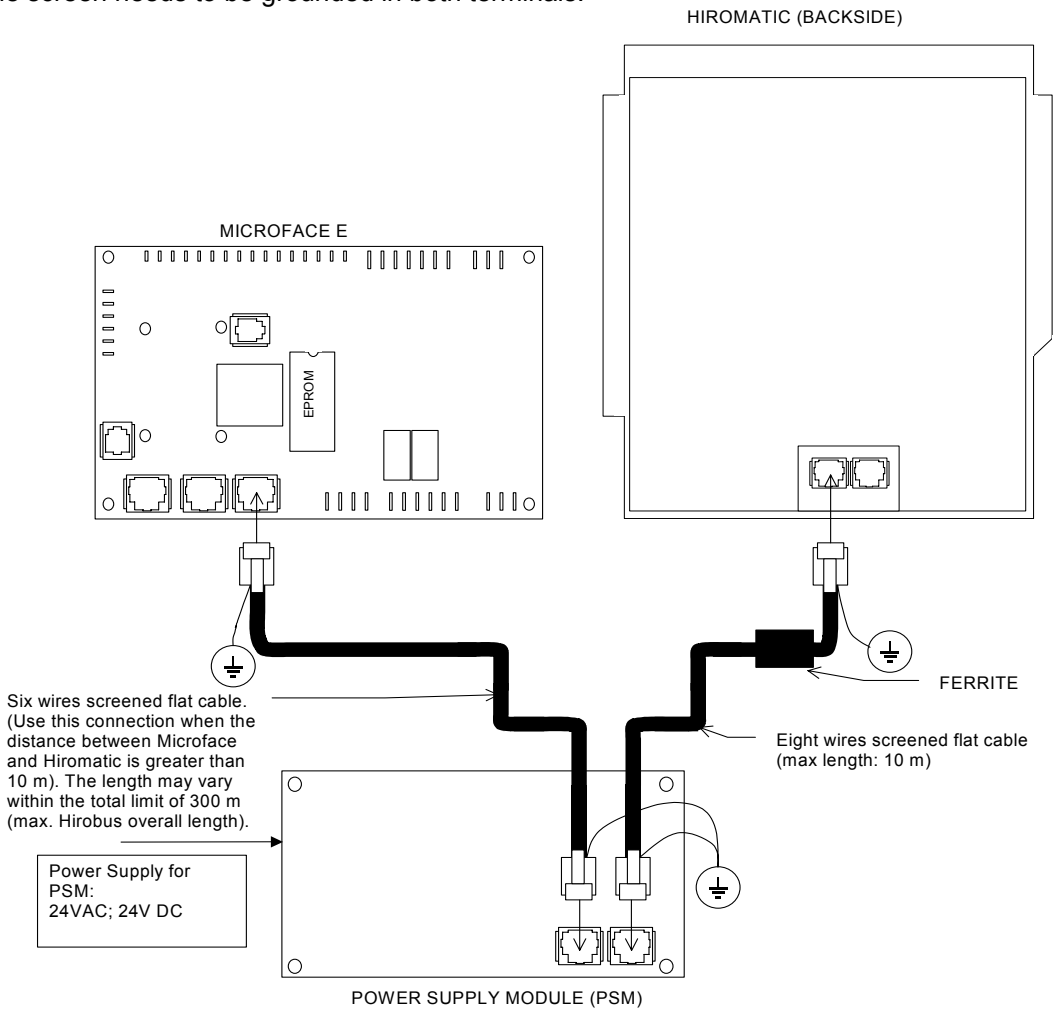

Figure 9 Connection of Microface E LAN to Hiromatic E with PSM.

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2.7 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..

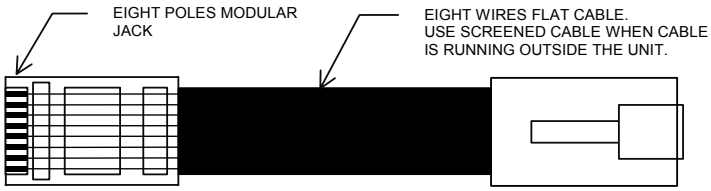


Figure 10 Eight-wires; eight poles connector HIROBUS cable, for Hiromatic and remote Display connections

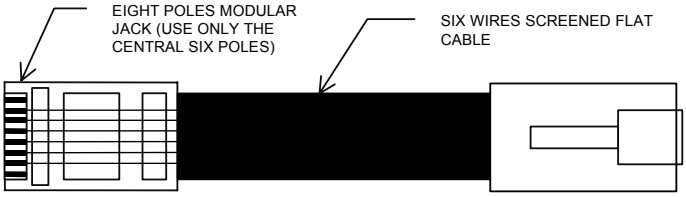


Figure 11 Six-wires eight poles connectors (Pin 1 and 8 not connected) HIROBUS cable, for Microface E and PSM, connection. This cable must be screened.

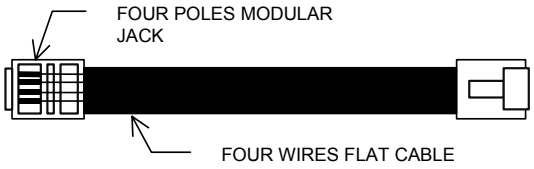


Figure 12 4 wires flat cable for local LCD Display, four poles connectors.

2.8 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)

2.9 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.

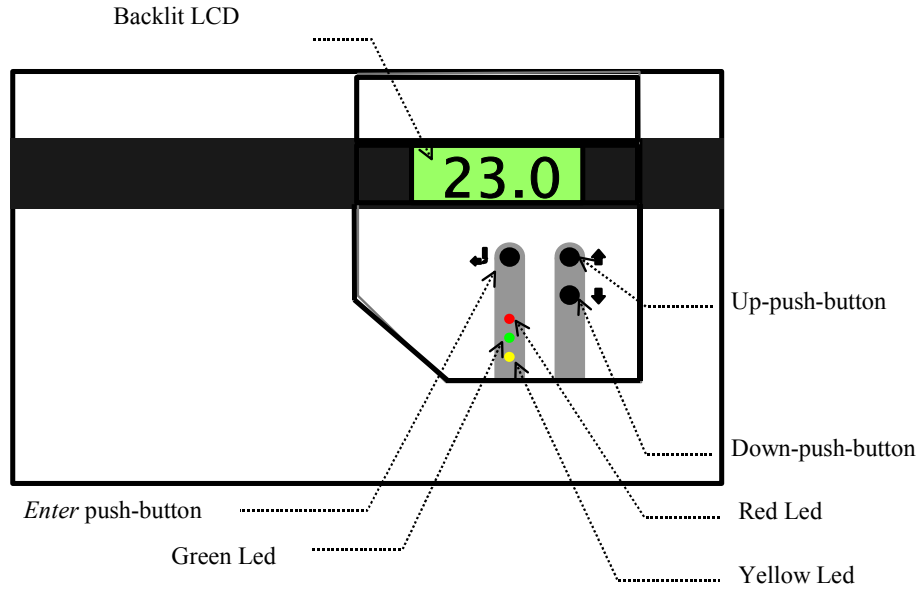
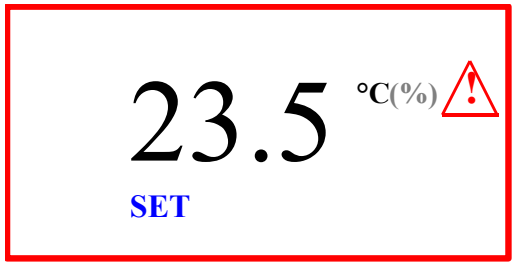


Figure 13 Interface module between Microface and operator (front view).

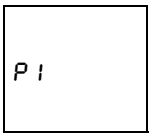
There are three LED's: the yellow Led to indicate the unit is power supplied, the green one lights up when the unit is in operation and the red one signals either an alarm or a warning condition.
On the LCD the following symbols will be displayed:

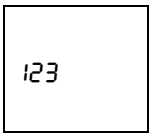


⚠	The alarm triangle is ON when either a warning or an alarm is active.
SET	The 'SET' string confirms the full access to the displayed parameters.
°C	The „°C" string appears when temperature is displayed on the LCD.

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

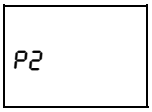
All Values and Parameters are listed up just one after the other. To jump the next parameter, simply the “down” button has to be pressed.

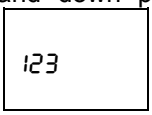




The name of the first parameter (*P 1* is not a real parameter, but only an example) will be displayed for one second, while the value itself will be displayed for two seconds (alternating) (this position is also considered as the “Home”.

▼ ▲ “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.	User Value
t in	Inlet Temperature: this is the average of the 2 inlet sensors temperature values.	--	0.1 (°C)	--
tou	Outlet Temperature: this is the actual outlet temperature value	--	0.1 (°C)	--
Ht1	High Inlet Temperature Level 1: this parameter allows defining at which inlet temperature value the related warning has to be activated. The event is not considered for a time of 5 minutes at each unit ON	No, 1 – 99	1 (°C)	
Ht2	High Inlet Temperature Level 2: this parameter allows defining at which inlet temperature value the related warning has to be activated. The event is not considered for a time of 5 minutes at each unit ON	No, 1 – 99	1 (°C)	
Ht3	High Outlet Temperature: this parameter allows defining at which outlet temperature value the related warning has to be activated. The event is not considered for a time of 5 minutes at each unit ON	No, 1 – 99	1 (°C)	
id1	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	-	
CA1	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
008	SL2	Smoke Alarm	Alarm: the event is activated if the unit is ON and the related input is open for 5 seconds minimum: Auto-reset function; the event disappear as soon as the related input is closed
009	rdo	Rear Door Open	Warning: the event is activated if the unit is ON and the related input is open for 5 seconds minimum: Auto-reset function; the event disappear as soon as the related input is closed. The Output 2 of Microface E board (used to disable the Fire Detection Device) will be activated every time the event is active.
010	Fdo	Front Door Open	Warning: the event is activated if the unit is ON and the related input is open for 5 seconds minimum: Auto-reset function; the event disappear as soon as the related input is closed. The Output 2 of Microface E board (used to disable the Fire Detection Device) will be activated every time the event is active.
012	bCo	Backup Cooling Active	Alarm: the event is activated when the backup cooling is active: Auto-reset function; the event disappear as soon as the related input is closed or the Ht2 event is not present
015	FdF	Fire Detection Failure	Warning: the event is activated if the unit is ON and the related input is open for 5 seconds minimum: Auto-reset function; the event disappear as soon as the related input is closed.
018	Hot	High Outlet Temperature	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 5 seconds: Manual Reset
022	Ht 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 5 seconds: Manual Reset
023	Ht2	High Inlet Temperature Level 2	Alarm: 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 5 seconds: Manual Reset When the event is active the Output 0 and 7 are activated as weel as the Backup Cooling (see bCo and F ir)
029	oSF	Outlet Sensor Failure	Warning: the event is activated with a delay of 30 seconds without any influence from the status of the unit: Auto-reset function; the event disappear as soon as the sensor is available
061	ISF	Inlet SX Sensor Failure	Warning: the event is activated with a delay of 30 seconds without any influence from the status of the unit: Auto-reset function; the event disappear as soon as the sensor is available
062	ISF	Inlet DX Sensor Failure	Warning: the event is activated with a delay of 30 seconds without any influence from the status of the unit: Auto-reset function; the event disappear as soon as the sensor is available
065	SL 1	Smoke Warning	Warning: the event is activated if the unit is ON and the related input is open for 5 seconds minimum: Auto-reset function; the event disappear as soon as the related input is closed
073	F ir	Fire Alarm	Alarm: the event is activated if the unit is ON and the related input is open for 5 seconds minimum The Outputs 0 and 7 of Microface E board (used to managed the Remote On Off of conditioners) will be activated every time the event is active: Auto-reset function; the event disappear as soon as the related input is closed

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

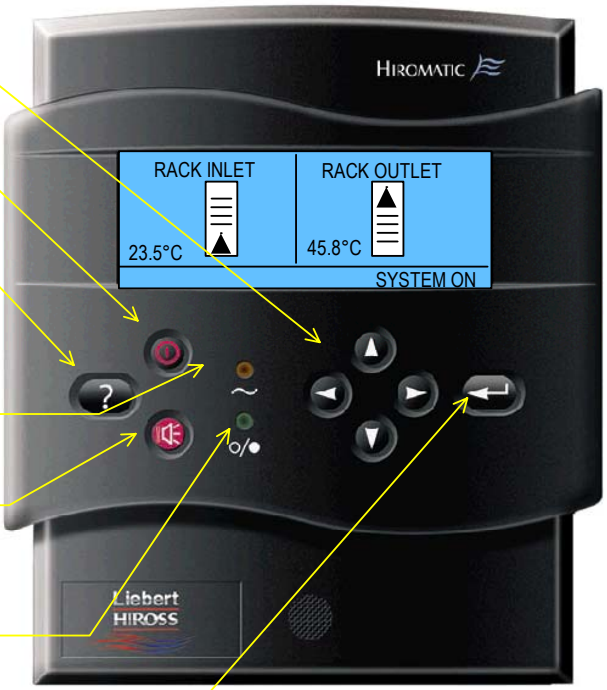
Help Key: not used

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



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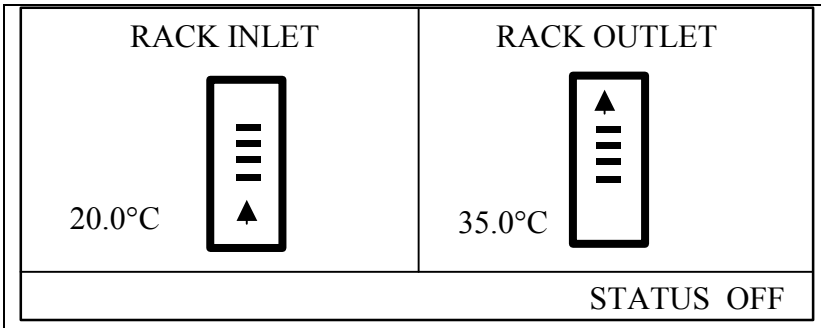
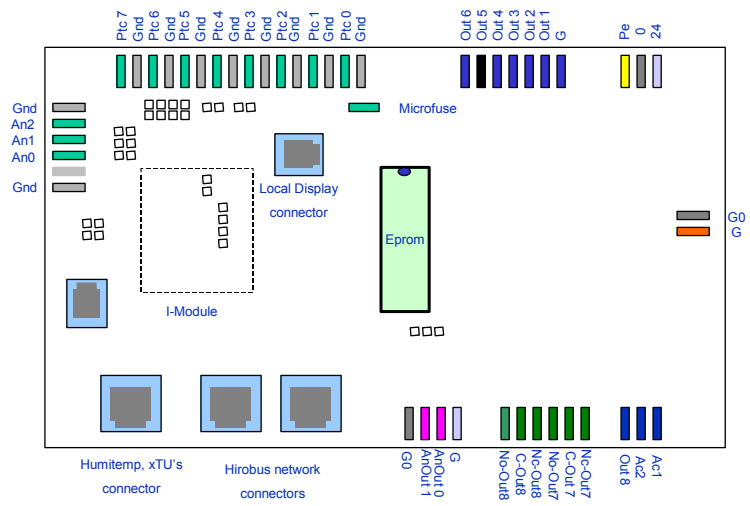
3.3.2 Hiromatic E Windows

	On the main page the actual temperatures are displayed. Press Down key for next page
INPUTS STATUS 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
OUTPUTS STATUS BACKUP COOLING OFF AUTO REMOTE UNIT STATUS OFF AUTO EXT.FIRE DETECTION ENABLED 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
TEMPERATURE WARNINGS HIGH OUTLET TEMPERATURE No°C HIGH INLET TEMPERATURE 1 38°C HIGH INLET TEMPERATURE 2 45°C	The parameters included on this page allow defining the high inlet and outlet temperature limit value Press Down key for next page
HIROMATIC SETTINGS PIEZO FEQUENCYOFF / 2.0 LISTEN PORT LANGUAGE ENGLISH DATE / TIME MO 21/11/2005 16:30 CONTRAST 220 BACKLIGHT OFF AFTER 5 min ADDRESS IP 129.100.19.115 LISTEN PORT 165	On this page is possible to configure the Hiromatic E as well as the address for the SNMP protocol communication. Press Down key for next page
SENSORS CALIBRATION ACTUAL OFFSET INLET TEMPERATURE SX 00.0 0.0 INLET TEMPERATURE DX 00.0 0.0 OUTLET TEMPERATURE 00.0 0.0	If required the offset of sensors mounted on board can be done. Press Down key for next page
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 Unit. This page is reachable from the main page easily pressing the Home key
STATUS REPORT PAGE 0 **UNIT** (01) 21.11.2005 16:30 RESET HIGH OUTLET TEMPERATURE	On unit status report page; the last 3 events are stored

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

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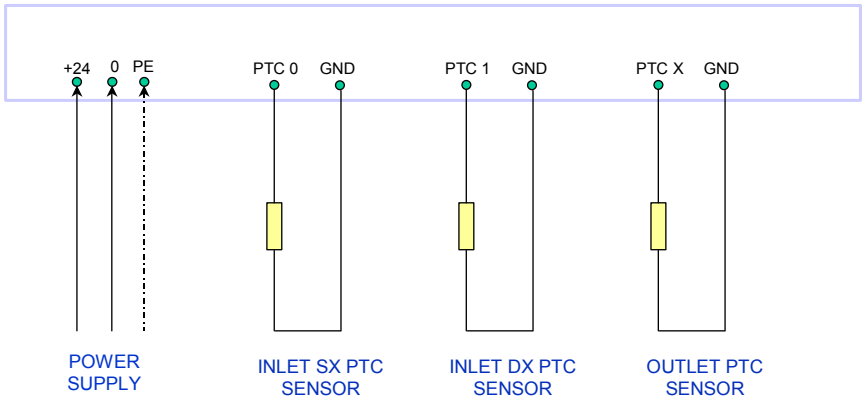
Outputs table

- Out 1 = Fan & Damper
- Out 2 = Fire Detection device Enable / Disable
- Out 0 = Remote Unit On Off
- Out 7 = Remote Unit On Off

Power supply &Sensors



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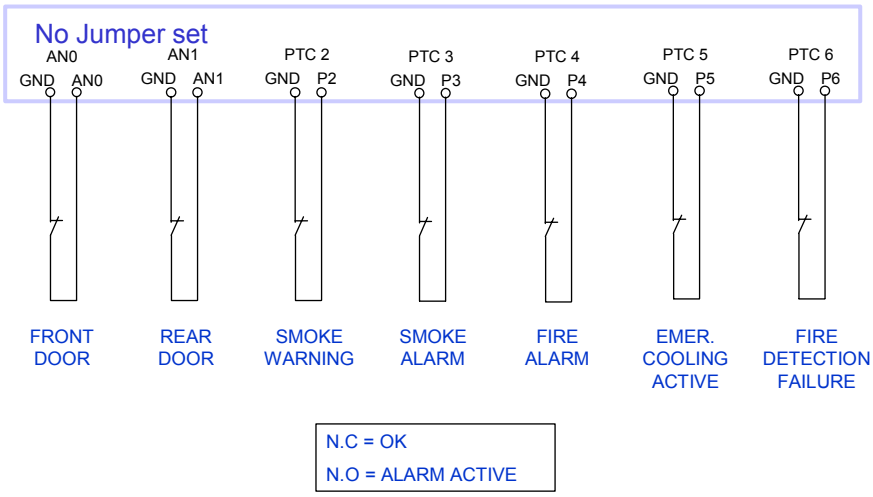
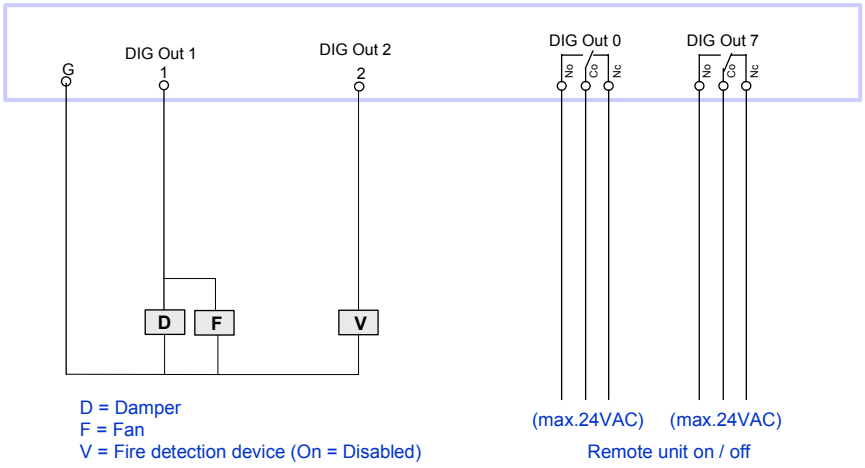
PTC & Analog inputs



N.C = OK

N.O = ALARM ACTIVE

Digital Outputs



D = Damper
F = Fan
V = Fire detection device (On = Disabled)

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

Remote unit on / off

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