GB

MUX.8/.16

INSTALLER
MANUAL
VERSION B2

FANCOM B.V.
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CE

FANCOM B.V. Limited Warranty Statement

Fancom expressly warrants each new product manufactured by it to be free from defects in material or workmanship for two years from the date of initial installation by or for the original purchaser, but in no event shall such period be greater than two years and three months from the date of initial shipment of the product from the manufacturer's facility. The following warranties are in lieu of any and all representations and warranties, express or implied, including the implied warranties of merchantability or fitness for a particular purpose, whether arising from statute, common law, custom or otherwise. Fancom shall not be liable for any special, consequential or incidental damages resulting from the use of any of the products or caused by any defect, failure or malfunction, whether a claim for such damage is based upon warranty, contract, negligence or otherwise, and in no event shall Fancom be liable for any damages in excess of the amount paid for the products. In the event a defect is found by the Manufacturer to exist within this period, the Manufacturer will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchase price to the original purchaser, in lieu of such repair or replacement. Labour costs associated with the replacement or repair of the product are not covered by the Manufacturer.

WARNING: Independent alarm installation

Like all mechanical and electronic devices, the Fancom Control Unit may fail. Thus, when the Fancom Control Unit is controlling the environment for confined livestock, it is highly recommended by Fancom that an independent alarm system be installed. The Fancom Control Unit does provide a connection port designated for either make or break contact for the sounding of an alarm condition (please refer to installation guide for location). Failure to comply with the above warning may result in loss of product and/or profits, for which Fancom is not responsible or liable.

Always keep this manual by your computer

January, 2001

GB010902 **MODIFICATIONS RESERVED**
Art. Nr. A5911366

Table of contents

About this manual

This manual contains information about the installation and service of the computer. Read this manual carefully and follow all safety instructions. The installer's settings can then be entered and the computer prepared for further use.

This manual has been written by Fancom for the installer. A user's manual is also available for the user. The user's manual contains information about the daily use of the computer.

If you have any questions regarding the computer, please do not hesitate to contact your Fancom dealer. The subjects discussed in this manual are listed in the table of contents.

The following symbols are used in this manual:

☞ Suggestions, advice and notes with additional information.

Caution
The product could be damaged, if the procedures are not followed carefully.

Caution
Life threatening situation, if the procedures are not followed carefully.

1. Introduction

The MUX.8/.16 computer is suitable for carrying out an identical measurement at maximum 16 different locations or a double measurement at maximum 8 different locations. For example, maximum 16 identical CO_2-measurements in mushroom growing rooms; maximum 16 identical O_2-measurements in tunnels or eight CO_2-measurements and O_2-measurements in fruit storage rooms.

With double measurement the same air sample is measured by two measuring transducers. For this the valve and hose system do not need to be carried out twice.

The MUX.8/.16 computer can also be used to control based on these measurements. For example, for automatic switching on and off of a fan based on an O_2-measurement.

It is also possible to switch a relay at fixed times using time clocks.

2. Technical specifications

Power supply	
Mains voltage	230Vac (-10% +6%)
Mains frequency	50-60Hz
Maximum power consumption	150VA

Power available for sensors and equipment	
24Vdc	max. 500mA
12Vdc short circuit resistant	max. 150mA
24Vac	Max. 4A

13 Relay outputs	
Relays 1-12 voltage free*	max. 2A 60Vdc/30Vac or 2A 250Vac
Relay 13 (alarm relay) voltage free	max. 2A 60Vdc/30Vac

10 Analog outputs (8 bits)	
Voltage range	0-10Vdc
Maximum load	1mA
Output resistance	570Ω

8 Contact inputs	
Open contact voltage (high level)	12Vdc
Low level	<1.5Vdc
-application: counter input, min. pulse width 2.5mSec	max. freq. 200Hz
-application: frequency input	max. freq. 5kHz

12 Analog inputs resolution 14 bits	
Types to be selected via jumper	-50°C to +110°C/
Temperature measurement range sensor type S..7	-58°F to +230°F
- accuracy (-25°C to +100°C/-13°F to +212°F)	<0.5°C/0.9°F
- accuracy (0°C to +60°C/32°F to +140°F)	<0.2°C/0.4°F
Resistance measurement range for position feedback	0-20kΩ
Voltage measurement range (input resistance 500k)	0-10Vdc
Accuracy voltage measurement	± 15mVdc

Housing

Sheet steel housing with polyester layer	IP54
Dimensions (lxwxh)	400×600×250mm / 15.7×23.6×9.8 inches
Weight (unpacked)	25kg / 55.1 lbs

Ambient climate

Operating temperature range	0°C to +40°C/32°F to 104°F
Storage temperature range	-10°C to +50°C/+14°F to 122°F
Relative humidity	<95%, uncondensed

Communication

Fnet Fancom network for intercommunication of process computers and connection to PCs.**

Optional: Fancom serial loop for intercommunication of process computers and connection to PCs.**

* If two terminal clamps are used next to each other, low voltage and weak current could not be used together. All cables used must be suitable for the highest voltage used, 220-240V. If weak current cabling is used, prevent the cables touching and/or crossing.

** For cable specifications, see connection diagram.

3. Safety instructions and warnings

3.1 General

Read the safety instructions carefully before mounting and installing the computer. The installation of the computer and trouble shooting must be carried out by an authorized technician/installer, according to the prevailing standards.

Fancom takes no responsibility for any possible damage as a result of incorrect settings and a non- or partially functioning installation.

3.2 Trouble


Never work on a computer with the power switched on.


Caution

1. Before a new fuse is placed, the cause of the defect should be remedied by an authorized installer.
2. Replace a defective fuse only by a fuse of the same type (see connection diagrams).

3.3 Installation

1. Take precautions against electrostatic discharge (ESD) when working on the computer.
2. Provide a clean and dry place to work


Disconnect power before installation.

3. Use correct wires as shown on the connection diagrams (appendix 3) and follow all instructions.
4. Make all wiring connections and check them before applying power.


Incorrect wiring may cause permanent damage.

☞ **Concerning the USA and Canada**
To simplify wiring the computer it is advisable to mount a 4" × 4" wireway below the computer. Two 1 ¼" wireways running between the computer and the wireway should be used, one for high voltage wire (rights side) and one for control voltage and sensors (left side). Seal all wireways after connection to prevent the entry of dust, aggressive gases and/or humidity. Use only shielded wire for sensors and control. Wires are to enter the computer and all Fancom computers from the bottom only!

4. Mounting and installation

Caution

It is essential that the alarm contacts of each computer are connected to a separate alarm system circuitry.

When mounting the computer, the following should be observed:

1. Never mount the computer near water pipes, drainage pipes etc.
2. Never mount the computer in a place where the weather has direct influence (not in the sun, not in places where the temperature can rise sharply, etc.).
3. Never mount the computer in a humid and/or dusty room and certainly not in the room where the animals are present.

   
   No condensation may take place in or on the computer.

4. Use the holes on the corners of the box to securely fasten the computer.
5. Mount the computer on a flat surface with the display at eye level. Ensure that the gland nuts are at the bottom of the computer.
6. Use gland nuts for the connection of the computer. Use the sealing plates to seal the gland nuts, which are not used. Seal all gland nuts after connection to prevent the entry of dust, aggressive gases and/or humidity.
7. Ensure that the frequency and voltage of the network for which this computer is made are the same as the voltage and frequency present.
8. To protect against lightning, place an over voltage protection device in the power supply of the computer. Provide an ample ground wire.

9. Connect each computer to its own circuit breaker from the main electrical service panel.
10. It should be possible to disconnect the computer using a switch or plug.


Ensure the computer is well grounded.

11. Separate high/low current wires by mounting them in separate cable channels.
12. If metal cable channels are used, ground them.
13. Mount the hoses from CO2-measuring point to CO2-sensor frost proof.
14. Mount the water separator approximately 30cm beneath the sensor.

Always observe the regulations of the electricity company

☞ **Advice**
Limit the length of the signal wires as much as possible; avoid crossing high/low voltage wires.

5. System settings

5.1 General

Fancom divides the system settings into seven groups:

System

```
1 Inputs
2 Outputs
3 Installation
4 Measuring times
5 Configuration
6 Test in/outputs
7 Internal RAM
```

Fancom will describe the system settings in the following sections. The correct settings can then be made.

5.2 Inputs

5.2.1 Analog inputs

At option 1 *Inputs* make the settings for the analog inputs. The polynomials can also be entered here.

```
>>Inputs
1 Analog in
2 Polynomial
```

2×

```
>>Analog in_1
Type:                    NONE
Meas. value                 0
Calib. value                0
Calibrate (U/R)             0
Zero      0      Span       0
```

Type

Enter the use for each analog input (12 in total). Possibilities:

NO measurement. The measured value can be entered manually for test purposes

1. TEMPERATURE, measurement (-50.0°C to 120.0°C / -58.0°F to 248°F) using an S7-sensor.
2. CO_2 3000PPM, measurement according to pre-set polynomial (Siemens).
3. CO_2 30000PPM, measurement according to pre-set polynomial (Siemens).
4. LINEAR (U), linear voltage measurement (0-10000mV) for relative humidity, for example (RH) or linear CO2/ O2-indicator.
5. LINEAR (R), linear resistance measurement (0-20000Ω) for potentiometer feedback, for example.
6. POLYNOM (U), non-linear voltage measurement (U = 0-10000mV) according to set polynomial (separate menu option).

☞ On the bottom board set per input using the jumper, whether the computer should measure a voltage or a resistance. A temperature sensor can be compared with a resistance. Ensure that this jumper setting corresponds to the chosen type. The jumpers are set as standard on resistance measurement

Measured value

The value on the input, converted to the type set. This value has no decimal point. The position of the decimal point depends on the type of measurement. A value that represents a temperature, will have one figure behind the decimal point, for example 235 = 23.5°C.

Calibration value

The value, converted to the type set. This value is expected by the computer when calibrating the Span.

Calibrate (U/R)

Temperature measurement

No calibration possible. A correction in tenths of degrees can be entered at the zero setting.

Other measurements

1. Set a value on the input that corresponds to the measured value 0;
2. Set *Calibrate (U/R)* to ZERO;
3. Wait until *Calibrate (U/R)* is 0 again;
4. Set a value on the input that corresponds to the calibration value;
5. Set *Calibrate (U/R)* to SPAN;
6. Wait until *Calibrate (U/R)* is 0 again.

The input concerned has been calibrated. If calibration has been unsuccessful due to an unstable input, or the measured value is beyond reach, # will appear on the display instead of the value 0.

Example 1: RH meter: 0-5 Volt = 0-100% (linear)

1. Set *Type* to LINEAR (U).
2. Check the jumper.
3. Set *Calibration value* to 100.
4. Set 0V on the input.
5. Set *Calibrate (U/R)* to ZERO.
6. Wait until *Calibrate (U/R)* is 0 again.
7. Set 5V on the input.
8. Set *Calibrate (U/R)* to SPAN.
9. Wait until *Calibrate (U/R)* is 0 again. *Zero* will be approximately 0 and *Span* approximately 5000 (mV).

Zero/Span

The computer calculates the Zero and the Span during calibration. Write these values for each input on the installation report (appendix 3).

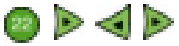
Table 1: Sensor types with their corresponding settings.

Sensor type	Analog input setting (input 9 and / or 10)		Polynomial setting (type polynomial)		
CO2 sensor Siemens 0 - 3000 ppm 0 - 10 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	CO2 3000PPM ..... 0 0 Span 0	not used		
CO2 sensor Siemens 0 - 30000 ppm 0 - 10 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	CO2 30000PPM ..... 0 0 Span 0	not used		
CO2 sensor Siemens 0 - 3000 ppm 0 - 5 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	POLYNOM. (U) ..... 10000 0 Span 0	Poly3 Poly2 Poly1 Poly0	15405 -15050 28930 -2635	e -13 e -10 e -6 e -5
CO2 sensor Siemens 0 - 6000 ppm 0 - 10 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	POLYNOM. (U) ..... 10000 0 Span 0	Poly3 Poly2 Poly1 Poly0	8023 -5359 3200 -560	e -13 e -9 e -5 e -2
CO2 sensor Siemens 0 - 10000 ppm 0 - 5 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	POLYNOM. (U) ..... 10000 0 Span 0	Poly3 Poly2 Poly1 Poly0	7181 -26420 6979 -2300	e -12 e -9 e -5 e -3
CO2 sensor Siemens 0 - 10000 ppm 0 - 10 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	POLYNOM. (U) ..... 10000 0 Span 0	Poly3 Poly2 Poly1 Poly0	6419 -12540 4822 -878	e -13 e -10 e -5 e -4
CO2 sensor Siemens 0-6000 ppm 0 - 5 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	POLYNOOM (U) ..... 10000 0 Span 0	Poly3 Poly2 Poly1 Poly0	7181 -26420 6979 -2300	e –12 e –9 e –5 e –3
CO2 sensor Siemens 0-10,0% 0 - 10 Volt non-linear	Type: meas.value calibr. value calibrate U/R Zero 0	POLYNOOM (U) ..... 10000 0 Span 0	Poly3 Poly2 Poly1 Poly0	15000 -11000 5816 -391	e -16 e -12 e -8 e -5
O2 sensor O2 sensor 0 – 25.0% 0 - 10 Volt linear	Type: meas.value calibr. value calibrate U/R Zero 0	LINEAR (U) ..... 250 (=25.0%) 0 Span 10000	not used		

Table 1 (continued): Sensor types with their corresponding settings.

Sensor type	Analog input setting (input 9 and / or 10)		Polynomial setting (type polynomial)
CO2 sensor 0 - 5000 ppm 0 - 5 Volt linear	Type: meas.value calibr. value calibrate U/R Zero 0	LINEAR (U) ..... 5000 0 Span 5000	not used
CO2 sensor 0 - 10000 ppm 0 - 5 Volt linear	Type: meas.value calibr. value calibrate U/R Zero 0	LINEAR (U) ..... 10000 0 Span 5000	not used

5.2.2 Polynomials



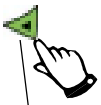
```
Poly3              0   e    0
Poly2              0   e    0
Poly1              0   e    0
Poly0              0   e    0
```

The characteristics that describe an input are entered using a polynomial. It is possible that a measuring device is used, that cannot be selected as standard on this computer (for example a pressure sensor). In that case, use a polynomial calculation.

☞ Contact Fancom first before setting polynomials yourself.

5.3 Outputs

```
>>Control              -01-
Type output          ANALOG
Control factor          0.1
Ctrl. time (h:m)       0:15
Hysteresis              100
Repeat time (m:s)      5:00
                         >>
>>Control              -02-
..........          ........
..........             ..,.
..........            ..:..
..........             ....
..........            ..:..
```



Press several times to access settings for other controls.

Control Enter the type of control. Possibilities:

NO	No control.
DATA	The MUX.8/.16 controls the last measured signal as an analog (0-10V). The voltage is directly proportional to the entered measuring range.
ANALOG (0-10V)	A correction will take place when there is a difference between the measured and control value. The extent of correction depends on the *Control factor* (factor between 0.0 and 1.0). The larger the control factor, the quicker correction will take place; with a control factor of 0.5 the computer will correct half the difference every *Control time.*
ON/OFF	This control ensures that the measured value does not differ too much from the control value. *Hysteresis* is the switch difference as with a simple thermostat. The control activates as soon as the measured value becomes more than the set switch difference below (type control INVERSE) or above (type control NORMAL) the control value. As soon as the measured value is again above/below the control value, the control is switched off. *Repeat time* is the minimum time between two switch actions, for example, the minimum on-time. When the control activates, the relay will remain “on” for at least this time and when switched off, will remain “off” for this time.
TIME PROP.	The computer often controls on/off air inlets with a switch difference. The lag arising from this control can sometimes lead to an unfavourable climate. If this is the case, use a time proportional control.

TIME PROP. (continued)

The working of a time proportional control can best be compared to that of an analog control (0-10V). The computer calculates a percentage, for example, 25%. With analog control the computer will have an output of 2.5V. However, with time proportional control the air inlet will be open for 25% of the repeat time. The air inlet will be closed for the rest of the time. *Hysteresis* is always 100.

Repeat time is the time needed by the controller to calculate the on/off time of the air inlet.

Repeat time = 100 sec. and calculated percentage = 1% → air inlet 1.0 sec. open
Repeat time = 50 sec. and calculated percentage = 1% → air inlet 0.5 sec. open

The *Control time* is in minutes. The computer determines to what extent it must take the past into account based on this time.

00 = do not take the past into account
xx = take the past into account for xx minutes

Control factor determines the extent of reaction by the control to a difference. The larger the factor, the greater the reaction to a difference.

5.4 Installation


```
>>Installation
No. of meas.              10
Min. range                 0
Max. range              3000
Contr. type           NORMAL
MUX type              SINGLE
Outs.temp.              AI11
Outs. RH              DIRECT
```

No. of meas. Enter the number of measuring points (0 to 16). Measuring points which have not been assigned cannot be measured and can therefore not cause an alarm.

☞ If *MUX type* = DOUBLE, a maximum of eight measuring points can be entered.

Min. range Enter the CO_2-content at which the analog output must have an output of 0V. If the measured CO_2-content is less than the set minimum CO_2-content, the output will always be 0V (only applicable with data transmission).

Max. range. Enter the CO_2-content at which the analog output must have an output of 10V. If the measured CO_2-content is more than the set maximum CO_2-content, the output will always be 10V.

Contr. type Enter the type of control. If the outputs are used for a control (no data transmission), the type of control should also be set. Possibilities:

NORMAL If the measured value is higher than the control value, the computer will increase the voltage of the analog output. For example, with CO_2 controls.

INVERSE If the measured value is lower than the control value, the computer will increase the voltage of the analog output. For example, with O_2 controls.

Type MUX

SINGLE The computer carries out one measurement per measuring point, e.g. 16 × CO_2. A measurement will only be carried out if the setpoint has been set. The maximum number of measuring points is 16.

DOUBLE The computer carries out two measurements per measuring point, e.g. 8 × CO_2 and 8 × O_2. The measurements of the first meter are displayed at measuring points 1 thru 8 and of second meter at points 9 thru 16. A measurement will only be carried out at a measuring point if the setpoint has been set at one (minimum) of the two measurements. A measurement will be made at measuring point 1 if the setpoint at measurement 1 and/or measurement 9 has been set. The maximum number of measuring points is eight.

Outs. temp. Enter whether the computer measures the outside temperature itself or receives it via communication with another computer:

EXTERNAL The computer receives the outside temperature via communication with another computer.

AI11 The computer measures the outside temperature using the outside sensor connected to analog input 11.

Outs. RH Enter whether the computer measures outside RH itself or receives it via communication with another computer:

EXTERNAL The computer receives the outside RH via communication with another computer.

DIRECT The computer measures the outside RH using an electronic RH sensor connected to analog input 12.

☞ Remember the jumper!

DRY/WET The computer measures the outside RH using two temperature sensors. One sensor, the wet bulb, is kept wet by a wick in a water reservoir (Fancom RH-measuring box). The computer calculates the relative humidity from these two measurements. The dry bulb is connected to analog input 11, the wet bulb to analog input 12.

☞ Remember the jumper!

5.5 Measuring times


```
>>Measuring times
Meas. time        -01-    60
Meas. time        -02-    60
Meas. time        -03-    60
Meas. time        -04-    60
Meas. time        -05-    60
Meas. time        -06-    60
Meas. time        -07-    60
Meas. time        -08-    60
Meas. time        -09-    60
Meas. time        -10-    60
Meas. time        -11-    60
Meas. time        -12-    60
Meas. time        -13-    60
Meas. time        -14-    60
Meas. time        -15-    60
Meas. time        -16-    60
Meas. time ref.           60
Cleaning time       0: 0:59
Ref. days                  0
Day counter                0
```

Meas. time 1…16 Enter how long (seconds) the measurements at measuring points 1 thru 16 must last. This time will increase the further the distance is between the multiplexer and the measuring point (minimum 1 second).

Meas. time ref. Enter how long (seconds) the reference measurement must last. If the measuring time is set to 0, the computer will not carry out any reference measurements.

Cleaning time Enter how long (hours, minutes and seconds) the measuring installation must be cleaned. For example, dehumidifying with tunnel installations (minimum 1 second). If, for example, 6 hours has been set, the computer will carry out measurements in all the relevant sections four times per day.

Ref. days Enter how often (in days) the computer must carry out a reference measurement. If this setting is on 0, the computer will carry out a reference measurement after each measurement cycle.

☞ In fruit storage reference gases are often used from a cartridge or cylinder. In this case it is preferable to carry out reference measurement once every few days, to limit gas use.

Day counter Readout of the number of days which have passed since the last reference measurement.

☞ The cleaning and reference measurement valves are opened while the measuring installation is being cleaned,. However, in the fruit storage sector reference gas is used for reference measurement. In order to clean regularly, an extra air release valve should be mounted and used to control the computer simultaneously with the cleaning valve.

5.6 Configuration

5.6.1 General


```
>>Configuration
1 General
2 Communication
```


```
>>General
New password
Time                      16:19
Date                Mo  26-05-97
Synchr. time              NO
Unit temp.                °C
Unit windsp.              m/s
Version:                MUXB1.0
```

New password See chapter 7 of the user manual.

Time The actual time in hours and minutes.

Date The actual day and date.

Synchr. time The Master computer can transmit the time to the other computers. Enter whether this should happen every 16 minutes or just once a day. Also do this for the Slaves. They will adopt the time from the Master.

Unit temp. Enter the unit of temperature: degrees Celsius (°C) or degrees Fahrenheit (°F).

Unit windsp. Enter the unit of wind speed: metres per second (m/s) or Miles per hour (Mph).
1m/s ~ 2.24Mph.

Version Version number of the MUX-software.

5.6.2 Communication


```
>>Communication
Computer number              1
Type                 L:  SLAVE
Baud rate               2400Bd
Comm       R:   0     T:    0
Network status               0
```

Computer number If the computer is part of a loop or network, each computer should have its own, unique number.

Type Enter whether the computer is functioning as Master or Slave. The Master is the computer which controls the communication. All the other computers in the loop (L) or the network (N) should be set as Slave.

Baud rate All the computers in a loop should have the same Baud rate setting. The loop communication normally works at 2400Bd. If a modem of 1200Bd is used, all the other computers in the loop should also be set to 1200Bd.

Comm. R: T: Communication counters with loop communication for receive (Receive) and transmit (Transmit). These counters can be used to trace faulty communication connections. In this case set all the counters on all the computers to “0”. Normally these counters increase simultaneously. Communication has failed between the last computer where the counters are increasing simultaneously, and the first computer where the counters are not increasing at the same speed.

Network status If several computers are connected via a network, the network status can be controlled. The network status is a value between 0 and 5. If the value is 5, the connection is in order. Every other value (0, 1, 2, 3 or 4) indicates that the network connection is not (yet) in order.

☞ 127 means that there is only one computer in the network.

5.7 Test in/outputs


```
>>Test in/outputs
Analog in_1              13.8
Digital in_1                0
Relay 1                     1
Analog out_1               10
Mode                  PROGRAM
```

Analog in (1…12) The value measured on the selected input.

Digital in (1…8) The level measured on the selected input.

Relays (1…28) The status of these relays:

0 = relay off
1 = relay on
-40 = relay temporarily on

In manual mode a relay can be activated (enter value 1) or deactivated (enter value 0).

Analog out (1…10) In program mode the actual value at the moment can be read out. 0-100 corresponds to 10-0V.
In manual mode a value between 0 and 100 can be entered, which will give an output of 0-10V.

Mode The following three modes can be set:

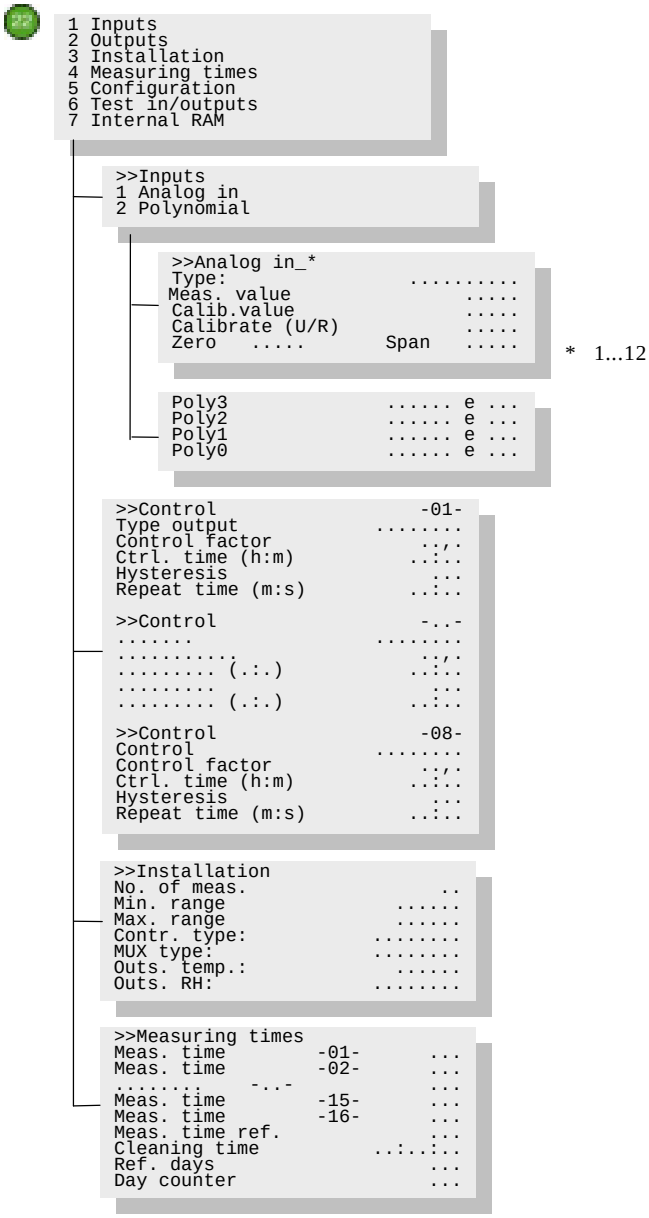
1. PROGRAM
Normal functioning.

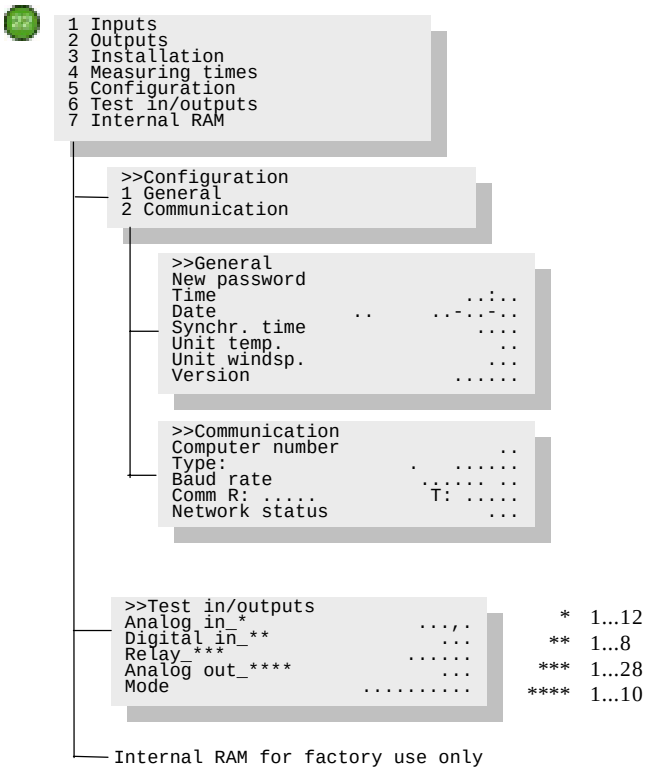
2. TEST MANUALLY.
Refer to description of *Relay* and *Analog out.*

3. TEST AUTOM.
The computer tests all the relays by briefly switching them on and off. The four indication lights at the top left of the front will light up one by one. The voltage on the analog outputs will gradually change.

Never do this on a computer that has already been installed!

APPENDIX 1: Menu overview system




1 Inputs
2 Outputs
3 Installation
4 Measuring times
5 Configuration
6 Test in/outputs
7 Internal RAM
>>Configuration
1 General
2 Communication
>>General
New password
Time ..:..
Date .. ..-..-..
Synchr. time ....
Unit temp. ..
Unit windsp. ...
Version ......
>>Communication
Computer number ..
Type: . ...
Baud rate ....
Comm R: ..... T: .....
Network status ...
>>Test in/outputs
Analog in_* ...,.
Digital in_** ...
Relay_*** ......
Analog out_**** ...
Mode ....
* 1...12
** 1...8
*** 1...28
**** 1...10
Internal RAM for factory use only

APPENDIX 2: System alarms

The computer executes a number of test actions which concern the functioning of the computer itself. If it detects an error, the code number of the error (a value greater than 100) will appear on the display.

Table 2: Overview system alarms

Cd.	Cause	Action
100	*Backup alarm* Something has gone wrong with the computer's memory while it was switched off. Settings and measurements have been erased and the computer is controlling on the factory settings. No communication is possible during this alarm.	Switch the alarm off. Re-enter the computer numbers and all the settings. If a PC is used in the system, all the settings can be protected, except the calibration values.
101	*Watchdog alarm* Program interruption	Turn the computer off and back on and check that it is operating correctly.
102	*Communication alarm* There has been no communication for a length of time.	Check the wiring and communication settings.
103	*Setting changed* During the automatic memory test, an error was found.	Switch the alarm off and check all user and installer settings.
104	*Stack overflow* Program interruption.	Turn the computer off and back on again and check that it is operating correctly.
105	*Communication assignment* There is another computer in the loop which has been set as Master.	Choose one Master computer and set all other computers to Slave.
106	*EPROM failure* during start-up or after a reset, a defect was found in the EPROM.	Turn the computer off and back on again and wait and see if this alarm occurs again.
108	*I/O alarm* There has been no communication with the I/O for a length of time	Turn the computer off and back on again and check that it is operating correctly.

APPENDIX 3: Installation report

User	**Installer**
Name:	Name:
Address:	Address:
Place:	Place:

Installation	**Data**
Date:	Computer model: *MUX.8/.16*
	Program version:

ANALOG INPUTS				
No.	**Standard type**	**Setting**	**Zero**	**Span**
1	Temperature			
2	Temperature			
3	Temperature			
4	Temperature			
5	Temperature			
6	Temperature			
7	Temperature			
8	Temperature			
9	CO2 3000ppm			
10	None			
11	Temperature			
12	Linear (U)			

POLYNOMIAL	
Poly 3	e
Poly 2	e
Poly 1	e
Poly 0	e

CONTROLS					
No.	**Control**	**Control factor**	**Ctrl. time (h:m)**	**Hysteresis**	**Rep. time (m:s)**
1					
2					
3					
4					
5					
6					
7					
8					

INSTALLATION		
	Standard	**Setting**
No. of measuring points	16	
Min. measuring range	0	
Max. measuring range	3000	
Control type:	NORMAL	NORMAL/INVERSE*
MUX type:	SINGLE	SINGLE/DOUBLE*
Outside temperature	AI11	AI11/EXTERNAL*
Outside RH	DIRECT	DIRECT/EXTERNAL/DRY-WET*

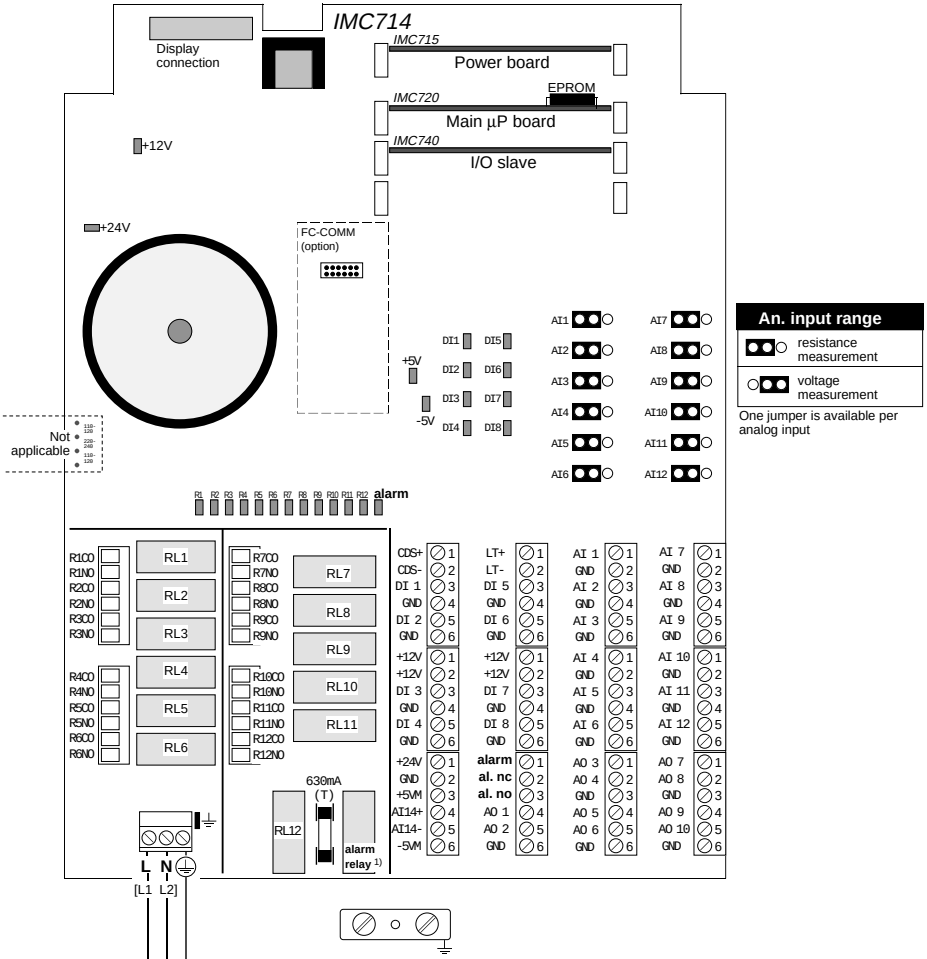
* Delete where not applicable.

MEASURING TIMES		
Measuring point (no.)	**Standard (seconds)**	**Time (seconds)**
01	60	
02	60	
03	60	
04	60	
05	60	
06	60	
07	60	
08	60	
09	60	
10	60	
11	60	
12	60	
13	60	
14	60	
15	60	
16	60	
Reference measurement	60	
Cleaning time	0: 0:59	
Ref. days	0	
Day counter	0	

CONFIGURATION		
	Standard	**Setting**
Baud rate	2400Bd	
Communication	MASTER	
Computer number	1	

FIXED ASSIGNMENTS			
Relay no.	**Multiplex meas. points**	**Relay no.**	**Multiplex meas.points**
1	1 and 9	5	5 and 13
2	2 and 10	6	6 and 14
3	3 and 11	7	7 and 15
4	4 and 12	8	8 and 16
9	active during cleaning of the installation		
10	active during reference measurement and cleaning		
11	active during measurements at measuring points 9 thru 16		
12	(undelayed) active during measuring point alarms (NO)		
Alarm	not active at loud alarm (NC)		
Relay no.	**Control meas. point**	**Relay no.**	**Control time clock**
13	1	21	1
14	2	22	2
15	3	23	3
16	4	24	4
17	5	25	5
18	6	26	6
19	7	27	7
20	8	28	8
AN. out no.	**data/control measuring point**	**AN.out no.**	**data/control measuring point**
1	1	5	5
2	2	6	6
3	3	7	7
4	4	8	8
DIG. In 1	flow alarm, digital report with fixed delay of 30 seconds. This alarm is blocked during cleaning.		

SPECIFICATIONS IMC714



An. input range

resistance measurement	
voltage measurement	

One jumper is available per analog input

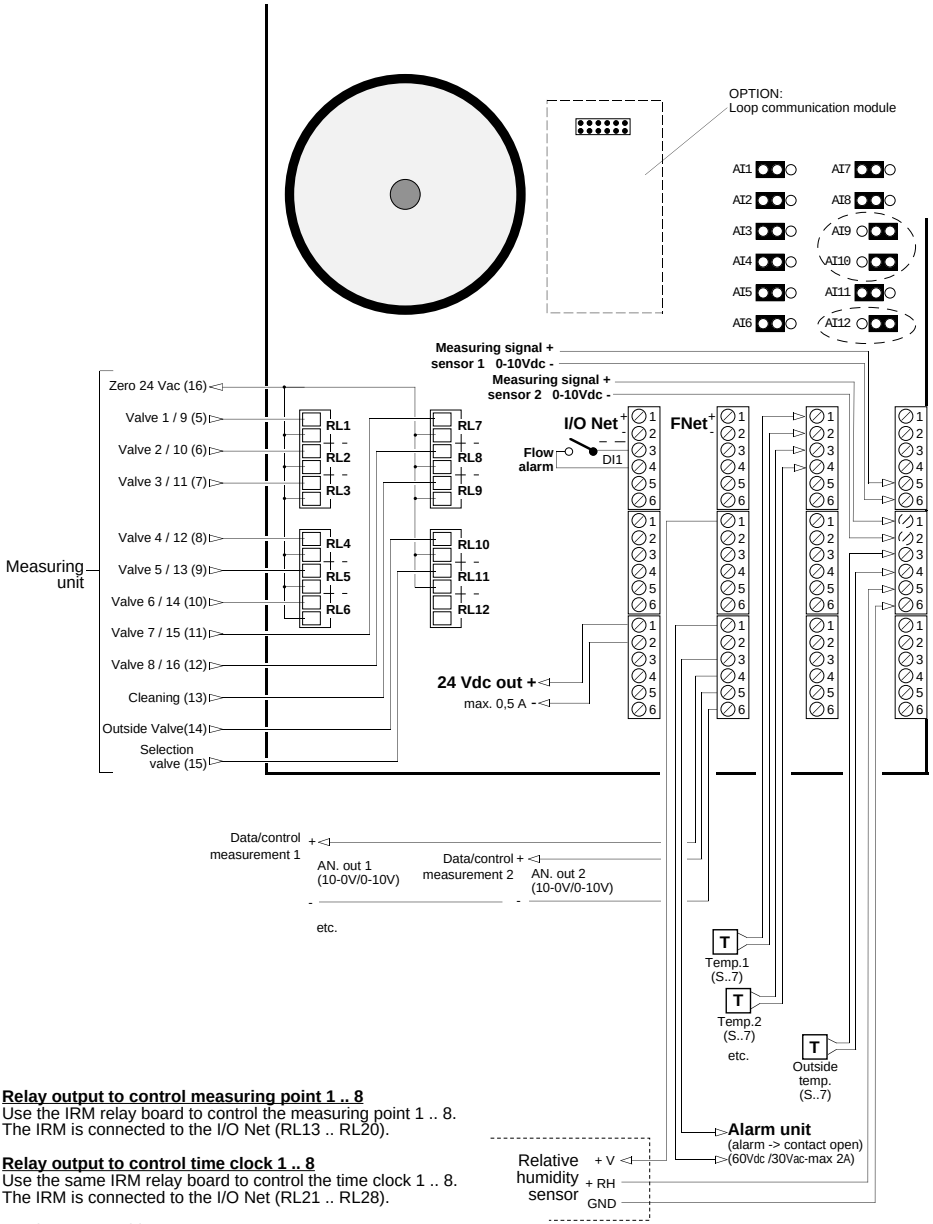
If low voltage and weak current are used together, please note that this is not permitted on one and the same terminal block.
All wires must be approved for the maximum voltage: 220-240V.
If you still wish to use weak current wires, ensure that the wires cannot touch and/or cross each other.

1) Alarm relay may only be used for weak current.

IMPORTANT!!!
All the equipment must be grounded correctly

Connect Fancom equipment according to the prevailing standards of the local electricity company.

CONNECTION DIAGRAM MUX.8/.16 (B2.0 -->)



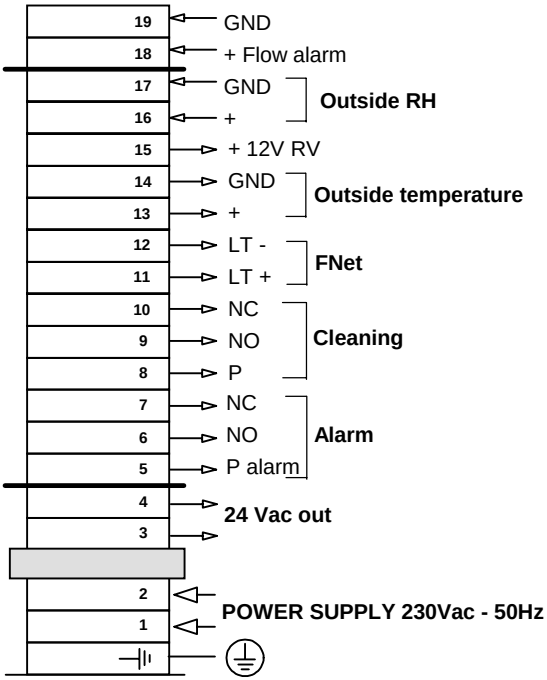
Relay output to control measuring point 1 .. 8
Use the IRM relay board to control the measuring point 1 .. 8.
The IRM is connected to the I/O Net (RL13 .. RL20).

Relay output to control time clock 1 .. 8
Use the same IRM relay board to control the time clock 1 .. 8.
The IRM is connected to the I/O Net (RL21 .. RL28).

Set the IRM to address 1.

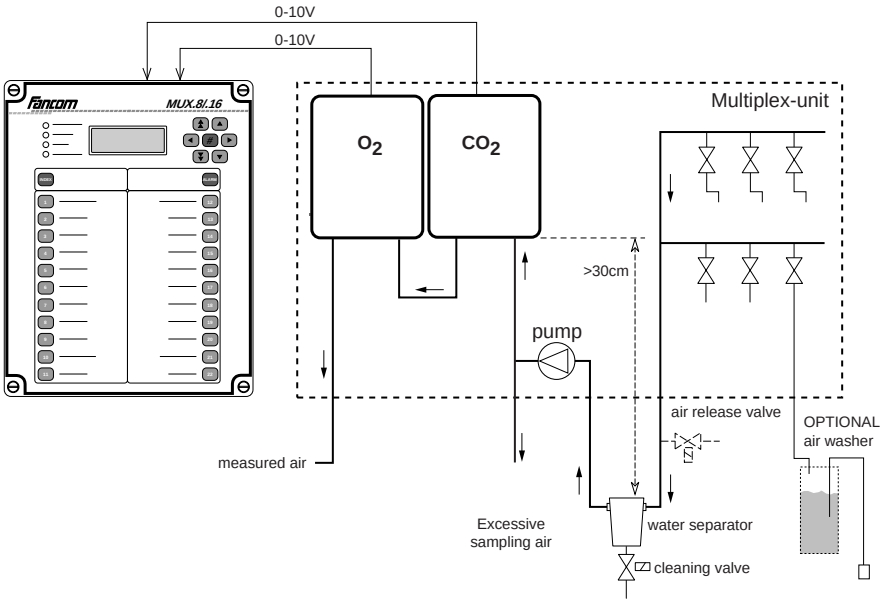
Connect Fancom equipment according to the prevailing standards of the local electrical company.

CONNECTION DIAGRAM STEEL MULTIPLEX BOX (B2.0 →)

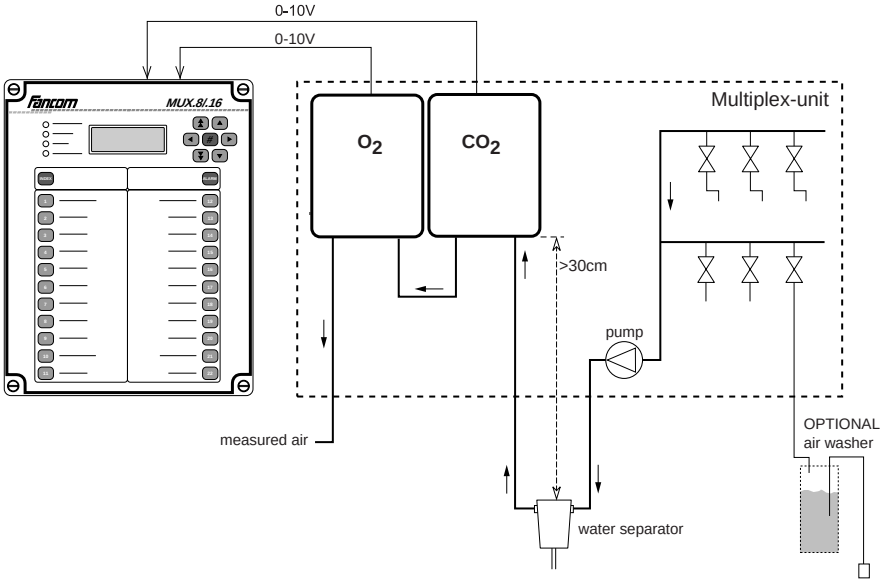


MUX.8/.16 Principal diagram

Water separator with cleaning valve

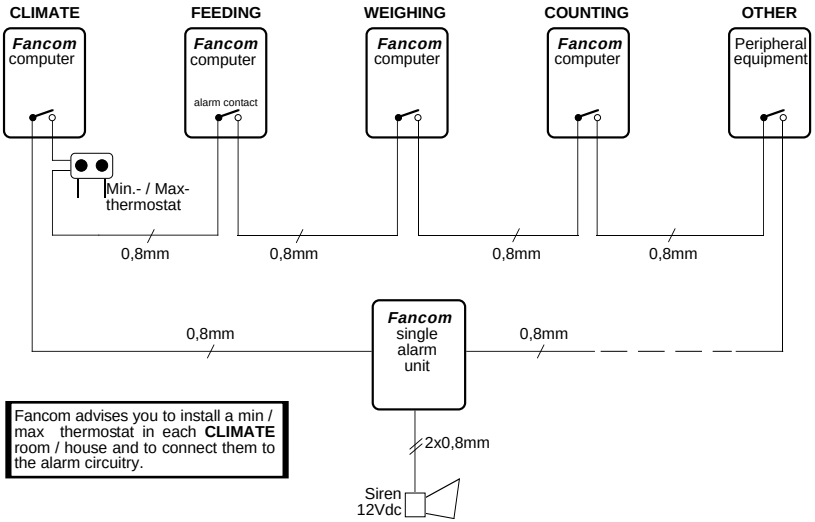


Water separator without cleaning valve



ALARM DIAGRAM WITH A SIMPLE ALARM UNIT

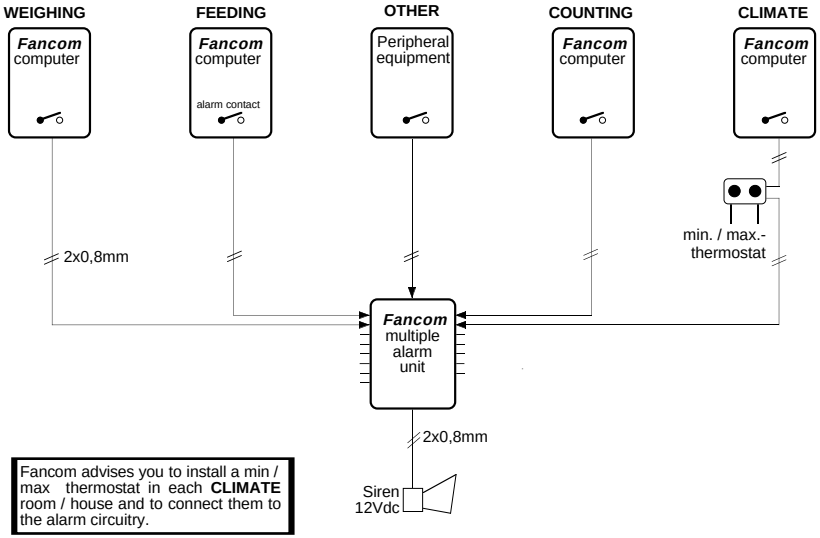
(all alarm contacts and min / max thermostats in series)



Fancom advises you to install a min / max thermostat in each **CLIMATE** room / house and to connect them to the alarm circuitry.

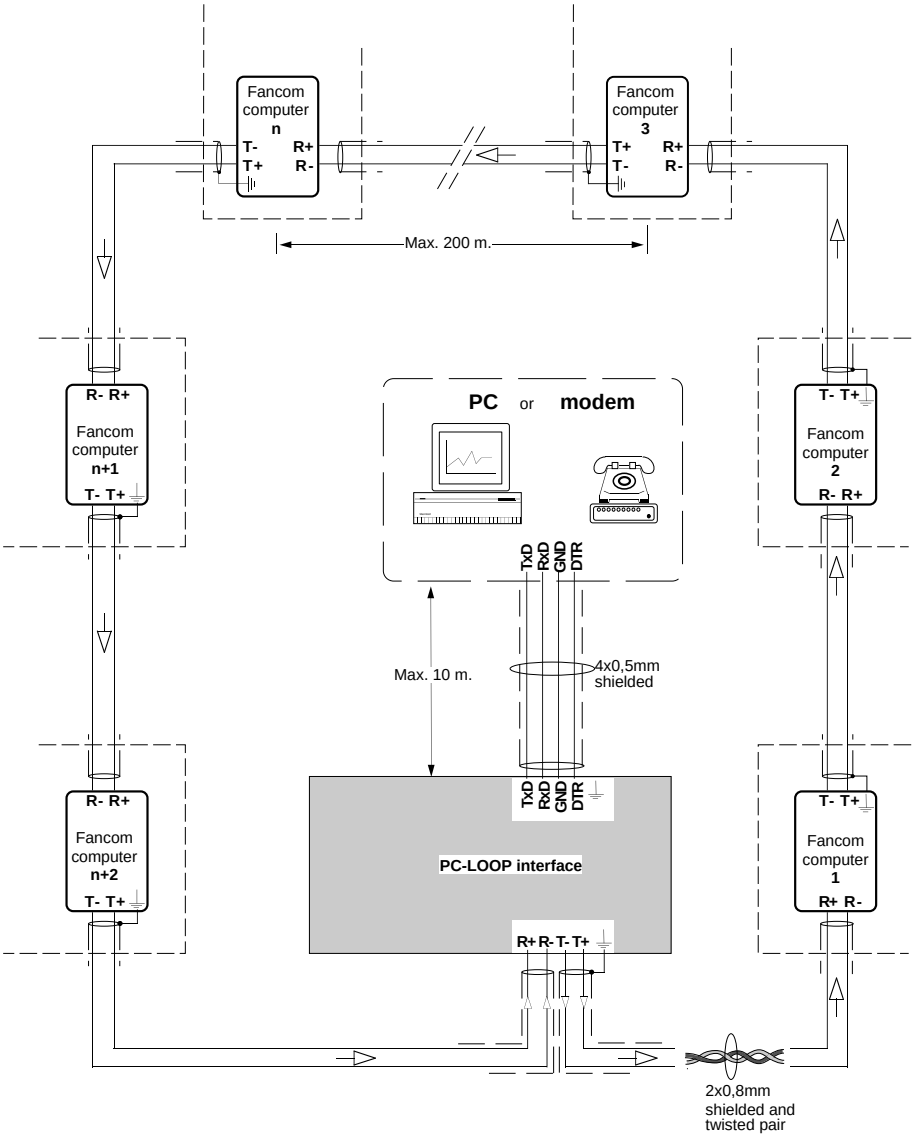
ALARM DIAGRAM WITH A MULTIPLE ALARM UNIT

(alarm per section)



Fancom advises you to install a min / max thermostat in each **CLIMATE** room / house and to connect them to the alarm circuitry.

GENERAL DIAGRAM LOOP COMMUNICATION

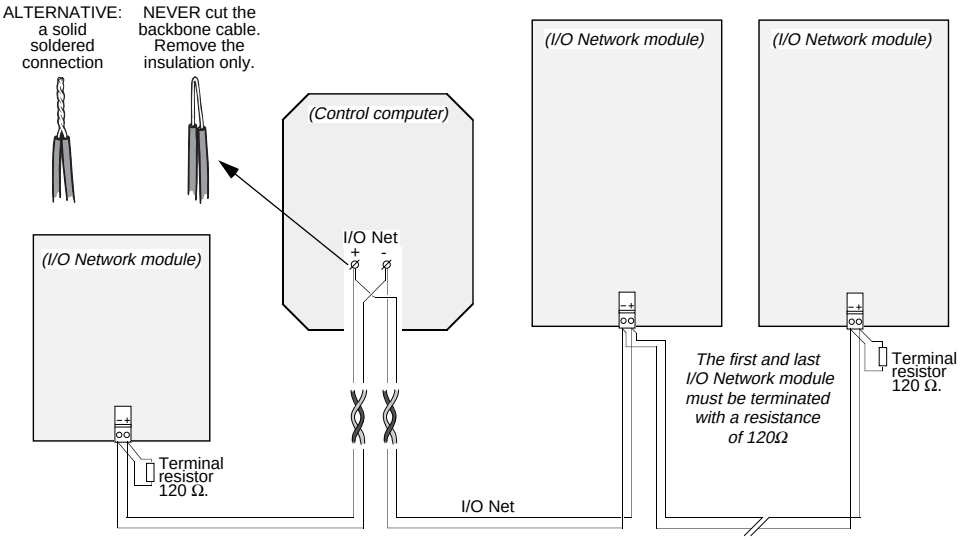


ATTENTION!!!
Ground the shield of the communication cable only on the transmit side (T+, T+).

Connect Fancom equipment according to the prevailing standards of the local electricity company.

CONNECTION I/O NETWORK

(control computer and I/O Network modules)



The order of I/O network modules is not important.

WIRING OF I/O NETWORK AND FNET:

1) Phone cable (unshielded) 2 wire (twisted pair) + a single wire (2x2x0.5mm + 1x0.5mm). One wire pair will not be used.

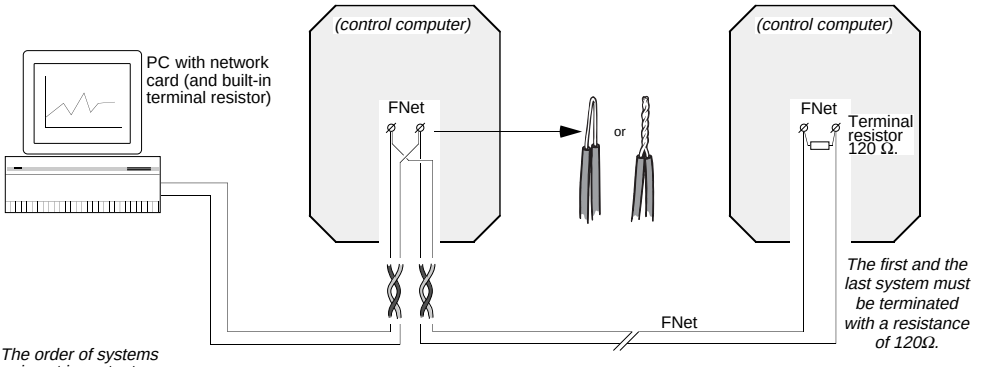
or

2) Unshielded 2 wire twisted pair (1x2x0.5mm or 1x2x0.8mm)

Max. length of both networks: wire: ø0,5mm --> 900m.
wire: ø0,8mm --> 1300m.

CONNECTION FNET

(control computers and PCs)



The order of systems is not important.

Polarity of FNet is not important.

Connect Fancom equipment according to the prevailing standards of the local electricity company.