GB

LUMINA 47
LUMINA 47 TOUCH

MANUAL

VERSION C1

Art.Nr. 5911878

GB140401

Table of contents

1. General introduction

This manual has been compiled with the utmost care. If, however, you should discover an error, please inform Fancom B.V..

1.1 How to use this manual

The following symbols are used in this manual:


Tips and suggestions.


Note providing recommendations and additional information.


Warning indicating damage to the product if you do not follow procedures carefully.


Warning indicating danger to humans or animals.


Electrical shock hazard. Danger to humans and animals.


Example of a practical application of the described functionality.


Calculation example.


Describes the key combinations for arriving at a particular screen.

Decimals

The control computer and this manual use a decimal point in values. For example: a weight is shown as 1.5 kg (not as 1,5 kg).

1.2 Fancom helpdesk

For any questions and support, please contact the local Fancom Sales & Service Center.

1.3 F-Central FarmManager™

Virtually all Fancom equipment can be controlled and managed from a central location. This requires the F-Central FarmManager software package and a communication module. The screens in the control computers are also used in F-Central FarmManager. This means you can start working immediately.

1.4 Safety instructions and warnings

Read the safety instructions, regulations and conditions carefully before installing and/or using the system. Installing the device and remedying any malfunctions must only be carried out by an authorized installer, according to the prevailing regulations. The guarantee will not apply if this product is built into a switch box in any way other than that indicated by Fancom.


The installation, of which this product is a part, must be equipped with a reliable, independent alarm system, for example, a minimum/maximum thermostat. We advise you to test the alarm system every day for proper functioning.

	If the product is part of a climate control system, the oxygen levels in the areas being controlled must always be maintained under all circumstances - even in emergency situations. We advise you to use an emergency system (emergency power supply unit, emergency opening systems, option for manual operation) to guarantee the oxygen levels. This system must be regularly tested for proper functioning.
	The control computer is a piece of electronic apparatus. There is always a risk of a malfunction occurring. Fancom has made every effort to ensure that an alarm is given in the event of an emergency. Unfortunately, a 100% guaranteed cannot be provided as not all circumstances are under Fancom's control. Fancom cannot be held liable for any damage caused by incorrect settings and/or non or partial functioning of the entire installation. Ask your installer if the alarm outputs of each control computer have been connected to a separate alarm circuit.
	Inspect the control computer regularly for any damage. Report any damage to your installer immediately. A damaged control computer is dangerous! Do not use running water (high pressure cleaners) to clean your control computer. The control computer is water resistant, but not waterproof! Do not switch off the computer when houses are unoccupied; otherwise there is the risk of condensation forming in the computer.
	Disconnect power before installation or before carrying out any maintenance to the control computer.
	Take precautions against electrostatic discharge (ESD) when working on the control computer. Ensure the workplace is clean and dry.
	Use the wiring/cables indicated on the connection diagrams and follow all instructions (see installation manual). Only apply power after the wiring has been connected correctly. Incorrect connections can cause permanent damage. Before a new fuse is placed, the cause of the defect should be remedied by an authorized installer. Only replace a defective fuse by a fuse of the same type (see connection diagram).

When mounting the computer, the following should be observed:

	Never mount the computer near water pipes, drainage pipes etc.
	Never mount the computer in a place where the weather has direct influence (not in the sun, or in places where the temperature can rise sharply, etc.).
	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.
	Use the holes behind the cover screws on the corners of the box to securely fasten the computer.
	Mount the computer on a flat surface with the display at eye level (or slightly higher). Ensure that the gland nuts are at the bottom of the computer.
	Use gland nuts to connect the computer. Use the sealing plates supplied 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.
	To protect against lightning, place an over voltage protection device in the power supply of the computer.

2. Working

The Lumina 47 weighs individual animals, irrespective of the number of animals on the scales at any one time. The amount of manure on the scales also has no influence on the measurements. The figure below shows an example of a poultry weighing installation:

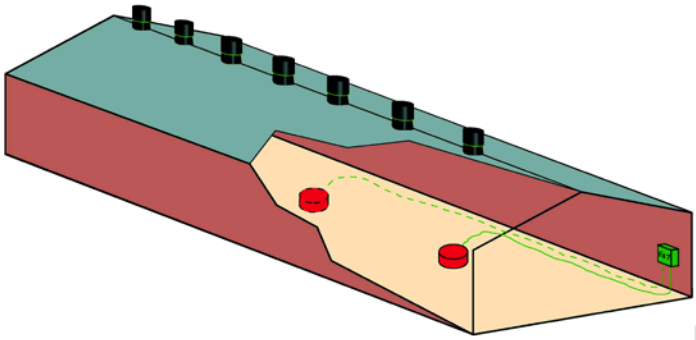


Figure 1: Principle of the Lumina 47 (one house with two weighing scales)

The Fancom weighing system consists of a computer and a maximum of two weighing scales. The scales are connected to the computer, which can be connected to a PC. The easy to read touch screen clearly shows all relevant information, not only in figures, but also as a descriptive text. The computer stores data concerning individual animal weighing per day, historical overviews relating to animal weight, growth, uniformity or covariance (CV) and the number of measurements up to 365 days back.

3. User

This section describes a number of user tasks. These are the basic tasks that can be performed using the Lumina 47.

3.1 Daily management

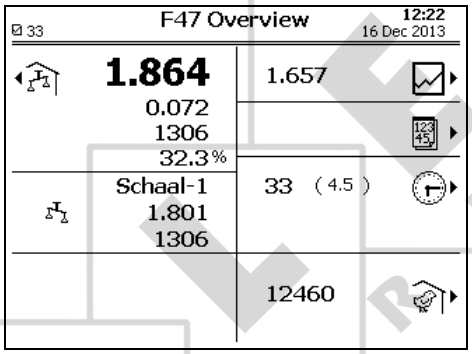
This section contains information about general management. The house management can be assessed quickly using the screen *Overview*. Use the menu options to request data about the controls and make any changes to important control values.

3.1.1 Overview screen

The control computer displays the *Overview* screen by default. This screen is a complete overview of the current process status and of any equipment managed by the control computer. The screen layout is related to the controls built into the control computer.

The image below is an example of the *Overview*. This image may differ from your screen because the control computer only displays the installed components.

User



Readout of the average weight, number of measurements, growth and uniformity percentage

Readout of the current weight (grams) and number of measurements of the connected scale(s).

As soon as the weighing system accepts an animal weighing, a chicken head symbol will briefly appear in the display. The corresponding weight will remain visible in the display for a few seconds.

Readout of the current growth standard.

Readout of the history weight data.

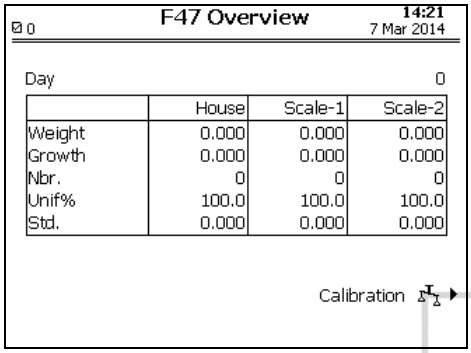
Readout of the current day number and measuring time.

Readout of the number of set up animals.

3.1.2 Weight data

Current data

Overview →



Day — Readout of the current day number.

Weight — Readout of the current animal weight. The Lumina 47 re-calculates this value each hour using a special formula.

Growth — Readout of the daily weight increase per animal. The Lumina 47 re-calculates this value each hour. For a direct check of animal weight and accepted weight, see Overview (on page 4).

Nbr. — Read out of the number of measurements on that day.

Unif% — Readout of the uniformity percentage or covariance (CV) depending on the installer settings:

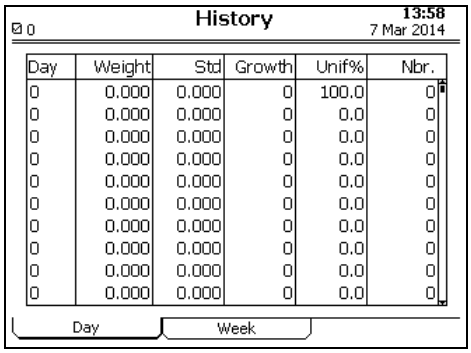
- The current uniformity percentage is the percentage of all measurements that fall within 10% (or 15%) of the average weight.
- The covariance (CV) is a calculated statistical value.

Std. — Readout of the theoretical weight from the growth standard, as expected on that particular day.

To calibrate the weigher press . For more information about calibration see (on page 21).

History data

Overview → → tab page *Day / Week*



Day / *Week*	Readout of the day (or week) number of the current cycle.
Weight	Readout the animal weight on that day (or week).
Std	Readout of the theoretical animal weight for that day (or week), calculated from the curve.
Growth	Readout of the weight increase per animal on that day (or week).
Unif% / *CV*	Readout of the average uniformity percentage or covariance on that day (or week). The readout depends on what has been set.
Nbr.	Readout of the number of measurements on that day (or week).

3.2 Animal management

Animal management covers all actions which result in a different number of animals:

- Set up animals

  The control computer will control the climate based on the curve, if a curve is used. At set up enter from which curve day the climate must be controlled.
- Registering mortality

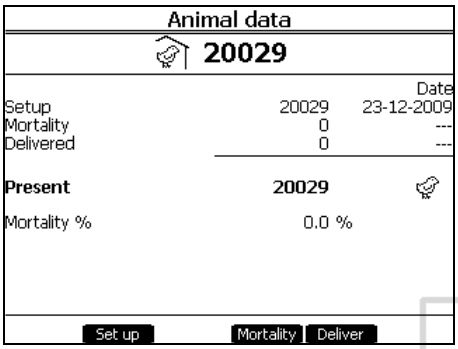
  The controls that depend on the number of animals will be adjusted.
- Delivering animals

  When some of the animals leave the house, the controls will be adjusted. If all the animals are delivered, the control computer switches to control based on the empty settings.

3.2.1 Animal management data

The overview screen shows the number of animals present in the house. More data is displayed in the screen below.

Overview →



The *Animal data* screen displays the total numbers set up, mortality and delivered. The date of the last change is shown behind each piece of information. The control computer calculates the data shown as follows:

Number of animals present = *Set up* – *Delivered* – *Mortality*

Mortality percentage = (Total *mortality* rate / Number of animals *set up*) × 100

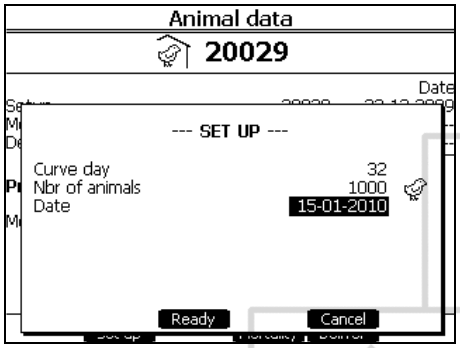
When animals have been delivered, the control computer shows the data of the delivered animals. This (old) data is saved until new animals are set up.

3.2.2 Set up flock

Set up the animals as soon as they enter the house. If control is based on the curve, the control computer will use the settings from the curve. If not enter these settings manually.

If there are no animals present, the control computer will set this number to 0. The control and registration data will not be saved. Note this data if you still need it.

Overview → → *Set up*



Curve day

Setting of the curve day number:

- Day number 0: do not control with the curve

  All control data must be entered manually. The day number stays 0 during the lifecycle of the animals.

- Day number 1 or higher: control with the curve

  The control computer increases this number by 1 every day at midnight.

At set up you usually start with day 1. If a higher day number is chosen, control will start further along in the curve.

Nbr of animals

Setting of the number of animals that have been set up.

Date

Setting of the date. The control computer only uses the *Date* for data registration. The control computer starts control immediately after the animals have been set up, even if a past or future date has been entered.

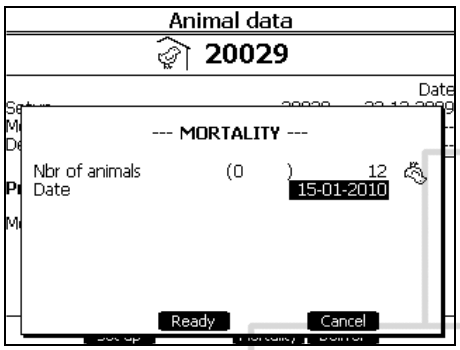
3.2.3 Animal mortality

The term mortality refers to sick or dead animals that have been removed from the house.

As mortality decreases the number of animals, the controls must also be adjusted. This can be done as follows:

- If control is manual (day number 0) enter the new settings manually.
- If control is based on the curve (day number 1 or higher), the control computer will automatically adjust the settings.

Overview → → *Mortality*



Nbr of animals

Setting of the number of removed animals. The number of present animals will appear between brackets.

Date

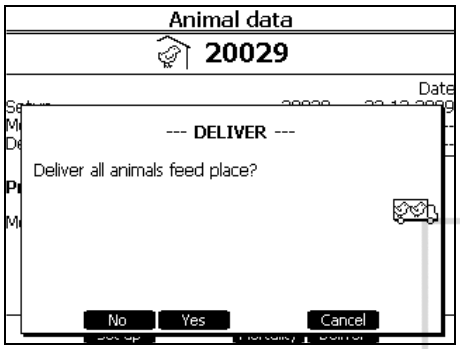
Readout of the current date.

3.2.4 Delivering animals

When animals are delivered they leave the house. These animals are booked out of the control computer. Animals can also be delivered at intervals.

When all the animals are delivered the control computer sets the day number to 0, and switches to control based on the empty settings. All offsets are set to 0.

Overview → → *Deliver*



Enter delivery data as follows:

1. Select the menu *Animal data*.
2. Press the key at *Deliver.*
3. Select one of the two options:

   Deliver all animals. To deliver all the animals in a house at the same time:

   1. Press the key at *YES.*
   2. Press the key at *Ready* to confirm the delivery.

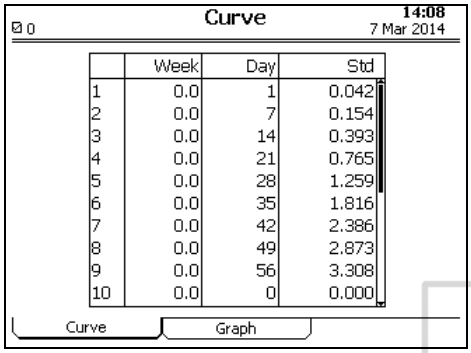
   Deliver a group of animals. To deliver a group of animals in a house:

   1. Press the key at *NO.*
   2. Enter the number of animals to be delivered and then press the Enter key.
   3. Press the key at *Ready* to confirm the delivery.

3.3 Settings

3.3.1 Growth standard

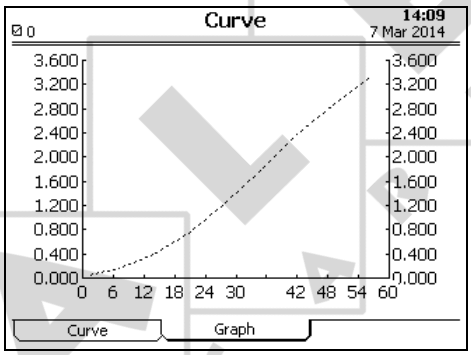
Overview → ☑ → **tab page** *Curve*



Day / *Week* Setting of a day/week number per bending point (max. 24 bending points).

Std Setting of the corresponding theoretical weight for each bending point.

Overview → ☑ → **tab page** *Graph*

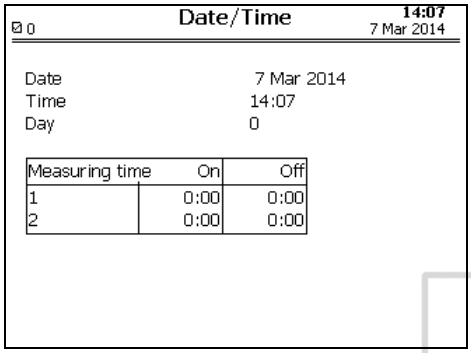


Graphical readout curve settings.

3.3.2 Time and date

For correct computer functioning, the system time and date must be current. Before making settings, check the system time and date.

Overview →



Date — Setting of the current date.

Time — Setting of the current time.

Day — Setting of the current day number.

Measuring time — Setting of the measurement times between which the computer must register measurements.

For continuous measurement both times should be set to 0:00

4. Installer

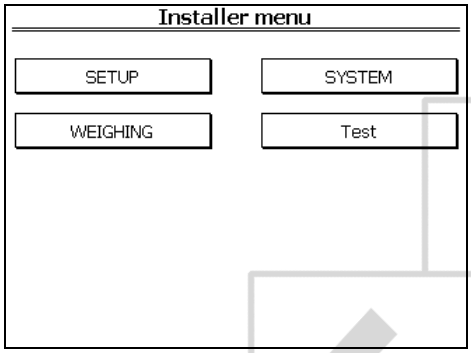
This section describes the installer displays of the installation menu.

4.1 Installing the control computer

4.1.1 Installation menu

The installer can configure the control computer using the installation menu. This menu also contains screens for standard system settings and diagnoses.

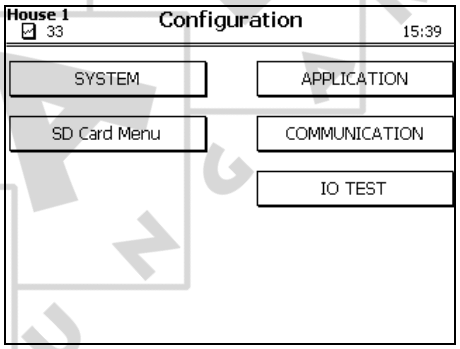
To call up the installation menu: log in to the role *Installer*. The following installation menu will appear:



4.2 System

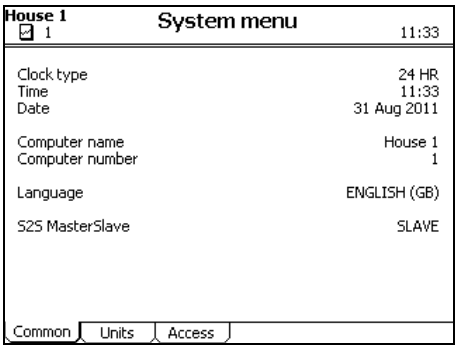
Access the system menu by pressing the UP and DOWN navigation keys simultaneously for a few seconds.

SYSTEM



4.2.1 System

SYSTEM → ***SYSTEM*** → **tab page** ***Common***



Clock type — Setting of the 12 or 24 hour time indication.

Time / *Date* — Setting of the current time and date

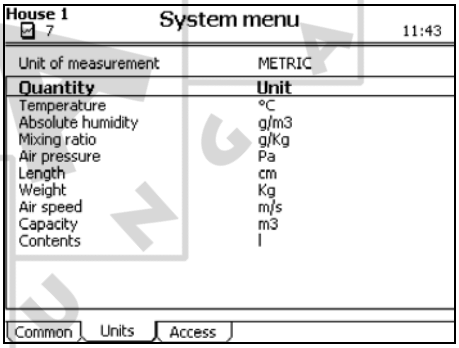
Computer name — Setting of the name of the control computer.

Computer number — Setting of the sequence number of the control computer in the network.

Language — Setting of the program language.

S2S MasterSlave — Master/Slave setting. If the control computer is included in a network, only one control computer in the network must be set as *MASTER*. Set all the other control computers as *SLAVE*.

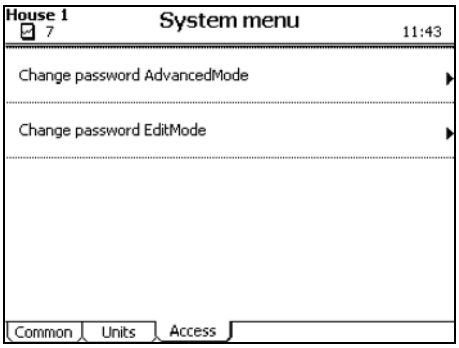
SYSTEM → ***SYSTEM*** → **tab page** ***Units***



Unit of measurement — Setting to simultaneously set all units to *METRIC* or *NON-METRIC*.

Use the + and – key on the alpha-numeric keyboard to change individual values.

SYSTEM → ***SYSTEM*** → **tab page** ***Access***



Change password AdvancedMode

Setting of a password to protect advanced user settings (option *More*) from use by non-authorised users.

- The password must contain four numbers.
- Enter code *1111* to deactivate the password protection.
- When the correct password has been entered, all user screens can be accessed.
- The system will request the password again, if the controller is not used for a few minutes.

*Change password EditMode.**

Setting of a password so that only authorised users can change the user settings.

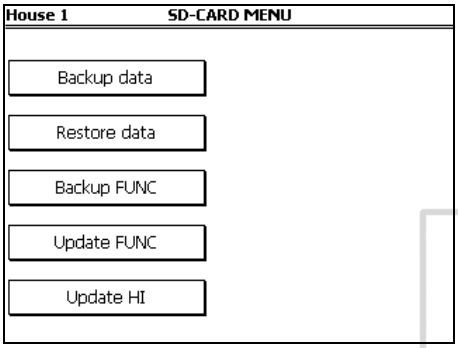
- The password must contain four numbers.
- Enter code *1111* to deactivate the password protection.
- If you have entered a password different to *1111,* the control computer will request the password when you try to change a setting. After you have entered the correct password, the setting can be changed.
- The system will request the password again, if the controller is not used for a few minutes.

4.2.2 SD Card Menu

The set data and the operating program in the control computer can be transferred to an SD-card. This data can be copied back onto the control computer from the SD-card. This must only be performed by an authorised installer, except when backups are made.

Place the SD-card in the SD holder on the FUNC (CPU).

SYSTEM → SD Card Menu



Backup data Backup data writes all the data set in the control computer to the SD-card (type .FBU). A service engineer may require this data so the settings can be checked on a different control computer.

Restore data Restore data re-loads saved data from the SD-card back onto the control computer (type .FBU).

Data saved on one control computer can only be loaded into another control computer if both computers are of the same type. In addition, the set control computer numbers must be identical. If both these conditions are not met, loading will fail.

Backup FUNC *Backup FUNC* writes a copy of the operating system (type .FIN) from the control computer to the SD-card.

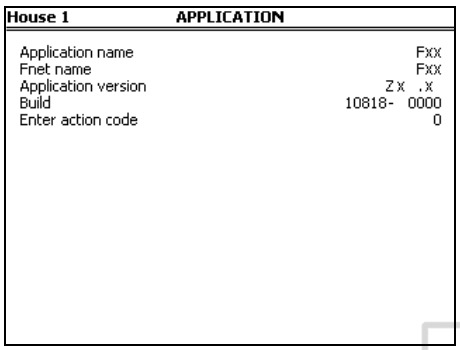
Update FUNC *Update FUNC* loads an operating system (type .FIN) from the SD-card onto the control computer. Select the required file using the + en – keys on the alpha-numeric keyboard. Confirm using the ENTER key.

Update HI *Update HI* (HI = Human Interface) loads an operating system (type .HIN) for the keyboard and the screen from the SD-card onto the control computer. Select the required file using the + en – keys on the alpha-numeric keyboard. Confirm using the ENTER key.

4.2.3 Application

The application menu contains the data of the control computer.

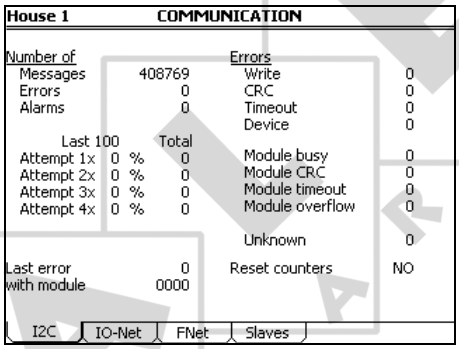
SYSTEM → *APPLICATION*



4.2.4 Communication

I^2C is a communication bus used to connect printed circuit boards in the control computer (e.g. AI.4).

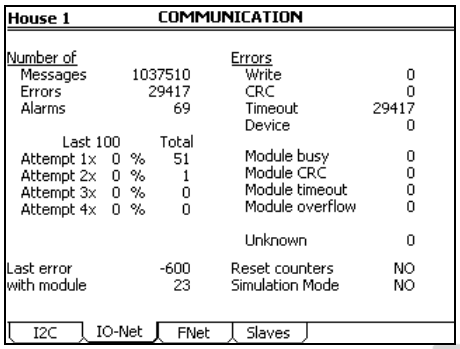
SYSTEM → *COMMUNICATION* → **tab page** *I2C*



Reset counters Setting used to reset all data to zero simultaneously.

The IO-Net is a connection for intelligent network modules. For example, Intelligent Relay Modules (IRM), Intelligent Digital Modules (IDM) or Intelligent Sensor Modules (ISM).

SYSTEM → ***COMMUNICATION*** → **tab page** ***IO-Net***



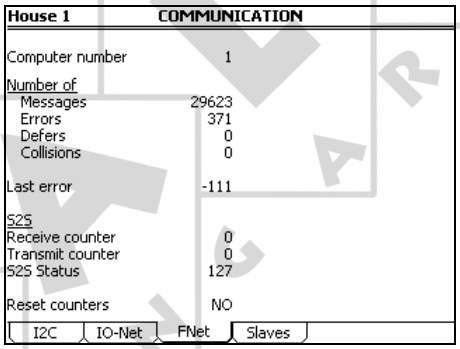
Reset counters Setting used to reset all data to zero simultaneously.

Simulation Mode Setting if the settings of the customer must be run in Simulation Mode.

If no IO-net modules are connected, the control computer doesn't give alarms during the Simulation Mode.

FNet is the Fancom Network. Several control computers can be linked via this network. FNet is also used to operate the connected control computers from a PC.

SYSTEM → ***COMMUNICATION*** → **tab page** ***FNet***

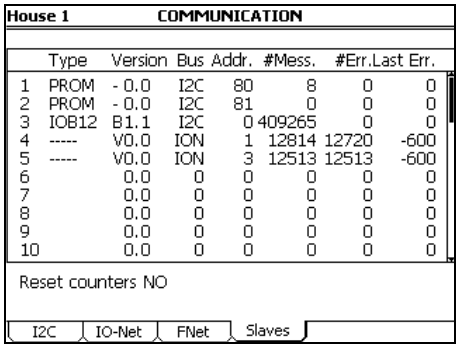


Reset counters Setting used to reset all data to zero simultaneously.

If there is no S2S communication, the Receive and Transmit counters should be set to 0.

Tab page *Slaves* shows the connected I2C modules and IO-Net modules and additional diagnostic data. It is intended to be used as a service tool to find communication errors.

SYSTEM → ***COMMUNICATION*** → **tab page** ***Slaves***



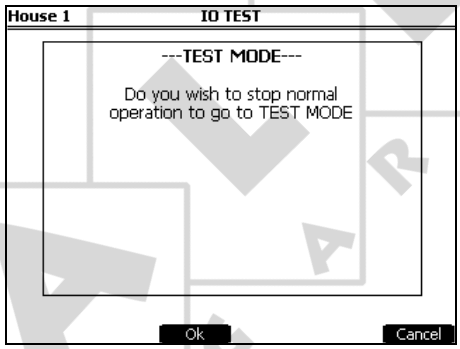
Reset counters Setting used to reset all data to zero simultaneously.

4.2.5 IO Test

Use the Input (I) and Output (O) test menu to set the control computer to test the communication channels.

In the IO-test menu inputs can be readout and outputs controlled at system level.

SYSTEM → ***IO TEST***

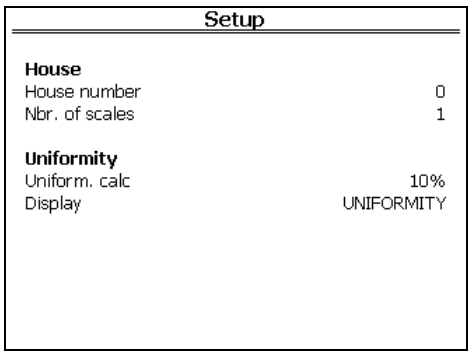


The functions in the IO-test menu stop all the control actions of the control computer. Only use this to quickly test IO functions.

This function may only be used by qualified personnel, as parts of the installation may be damaged with direct control.

4.3 Setup

Setup



House number — Setting of a unique house number. This is important if the computer has been included in a network (Fancom FNet).

Nbr. of scales — Setting of the number of scales connected to this computer (1 or 2).

Uniform. calc — Setting of how the computer must calculate the uniformity percentage: based on 10% or 15%. The uniformity percentage is the percentage of all measurements that fall within 10% or 15% of the average weight.

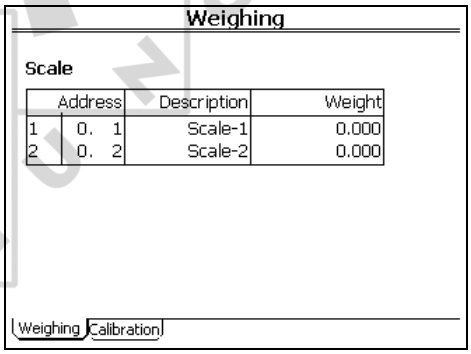
Display — Setting whether the uniformity percentage or the covariance is to be displayed.

4.4 Weighing (for service purposes only)

These settings/readouts are for service purposes only.

4.4.1 Tab page Weighing

Weighing → **tab page** *Weighing*



Address — Scale-1 and Scale-2 are connected to address 0.1 respectively 0.2 of the computer. Address 1.1 and higher means that the scales are connected via an I/O module.

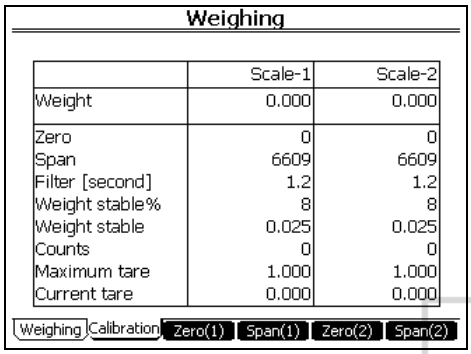
Description — Setting of a suitable name to the scales(s). The keyboard will automatically accept this alpha function. See also Alphanumerical keyboard.

Weight — Readout of the current weight (grams) and number of measurements of the connected scale(s).

4.4.2 Tab page Calibration

After installation, the weigher must be calibrated and adjusted. Use the functions on this tab page. These settings apply to all weigher types.

Weighing → **tab page** ***Calibration***



Calibrating weigher

To calibrate the weigher, a calibration weight is required. Use a calibration weight that is nearly as heavy as the maximum empty weight of the weigher/blender.

Calibrate the weigher as follows

1. Empty the weigher completely so the feed computer can determine the zero point.
2. Select *Zero*.
3. Press *Ready* to enter the zero point of the weigher.
   Tab page *Weighing* will appear again. *Zero* shows the number of counts of the zero point. Place a sufficiently heavy calibration weight in the weigher.
4. Select *Span*.
5. Enter the *Calibration weight* in the screen that appears. Press *Ready* to calibrate the weigher with this weight.
   Tab page *Weighing* will appear again. In *Span* the calibration weight will appear with the corresponding number of counts.

Setting weigher accuracy

When the weigher has been calibrated, determine weigher accuracy and carry out any further weigher calibration. The control computer uses the settings below to determine when a measurement is reliable.

Filter (second) Setting of the period within which the measured weight must be stable within the limits of the entered differences (*Weight stable*).

Weight stable Setting of the value of *Weight stable* (in KG).

Within the *Filter* time the difference between the highest and lowest weight must not exceed *Weight stable*. If the alarm message ‘weigher not stable’ appears, this value can be increased.

Counts Readout of the actual number of counts currently being read on the input.

Maximum tare

Setting of the maximum weight that is deducted from the gross weight to obtain net weight. If the actual tare is below the *Maximum tare* , the tare of the weigher is ascertained. Dosing in can then continue normally afterwards. If the *Maximum tare* is exceeded, no more dosing in can take place. The control computer stops, followed by a loud alarm.

The control computer automatically determines the *Maximum tare* when the weigher capacity is set (5% of the weigher capacity). The *Maximum tare* can then be adjusted manually.

Current tare

Readout of the current weight that is deducted from the gross weight to obtain net weight. The actual tare of the weigher.

5. System alarms

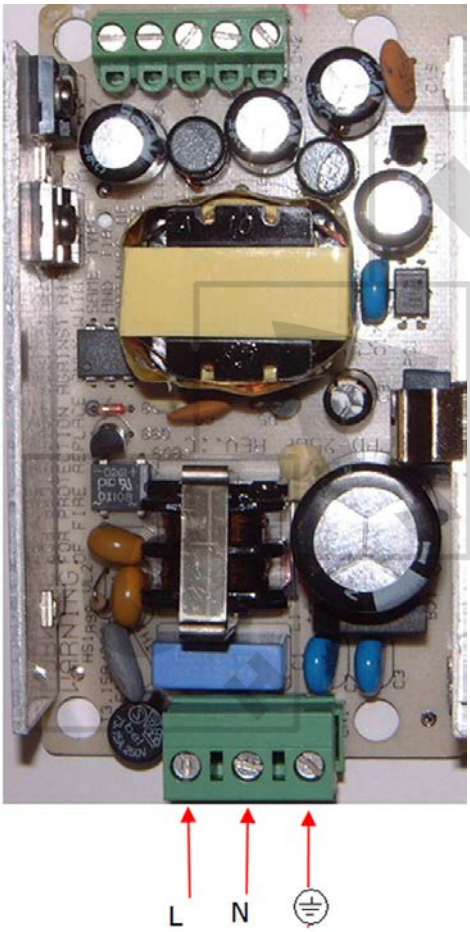
Alarm message	Cause	Action
FNet alarm	No communication with PC	Check wiring and connections
I/O-net alarm	No communication with I/O-modules	Check wiring and connections
I2C alarm	No communication between internal circuit boards	Check wiring and connections
1, 2 … 35	Specific system ERROR	Always warn the installer if a system alarm occurs.

6. Technical specifications

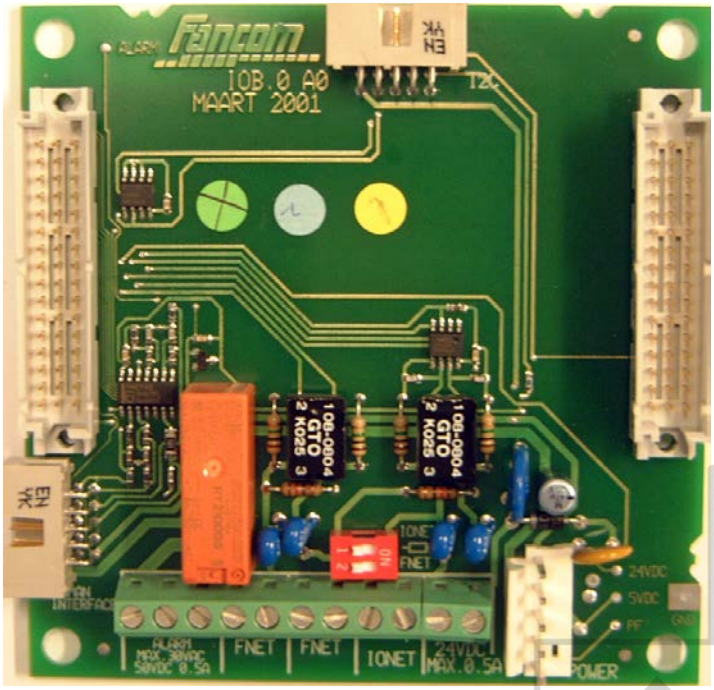
FDP25	
Mains voltage	90Vac – 264Vac
Main frequency	50/60Hz
Maximum power consumption	25VA
IOB.0	
Power available for sensors and peripheral equipment	
24Vdc (short circuit resistant)	max. 500mA
1 Digital output (Relay)	
Relay 1 (alarm relay): voltage free	max. 2A 60Vdc/30Vac
Communication	
I/O-Net for extra inputs and outputs using I/O-modules.	
FNet, Fancom network for intercommunication of control computers and PC connection.	
LCC	
Excitation voltage	5 Vdc
2 × Max. input signal	78 mVdc
Max. load	8x350 Ω
Cable length	Max. 50 m
Housing	
Plastic housing with screw-on lid	IP54
Dimensions (l×w×h)	300×240×140mm
Weight (unpacked)	2.6kg
Ambient climate	
Operating temperature range	0° C to +40° C
Storage temperature range	–10° C to 50° C
Relative humidity	< 95%, uncondensed

6.1 The inside of the control computer

6.2 FDP25

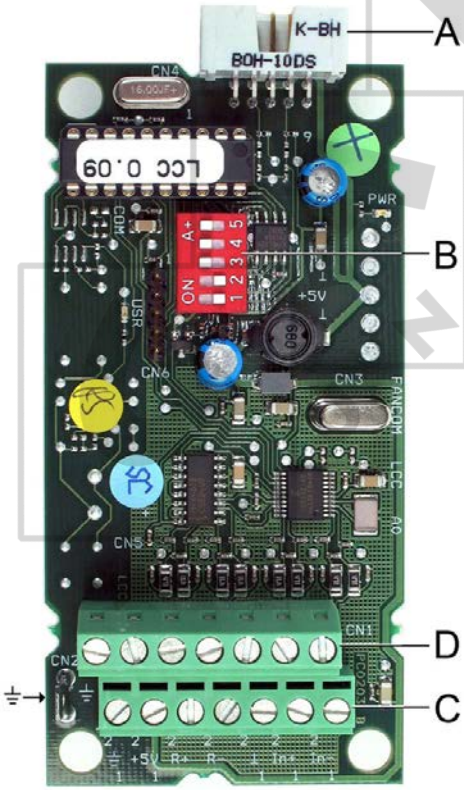


6.3 IOB.0



Relay 1 Digital output (Alarm relay)

6.4 LCC



A I2C connection to IOB

B Dipswitch

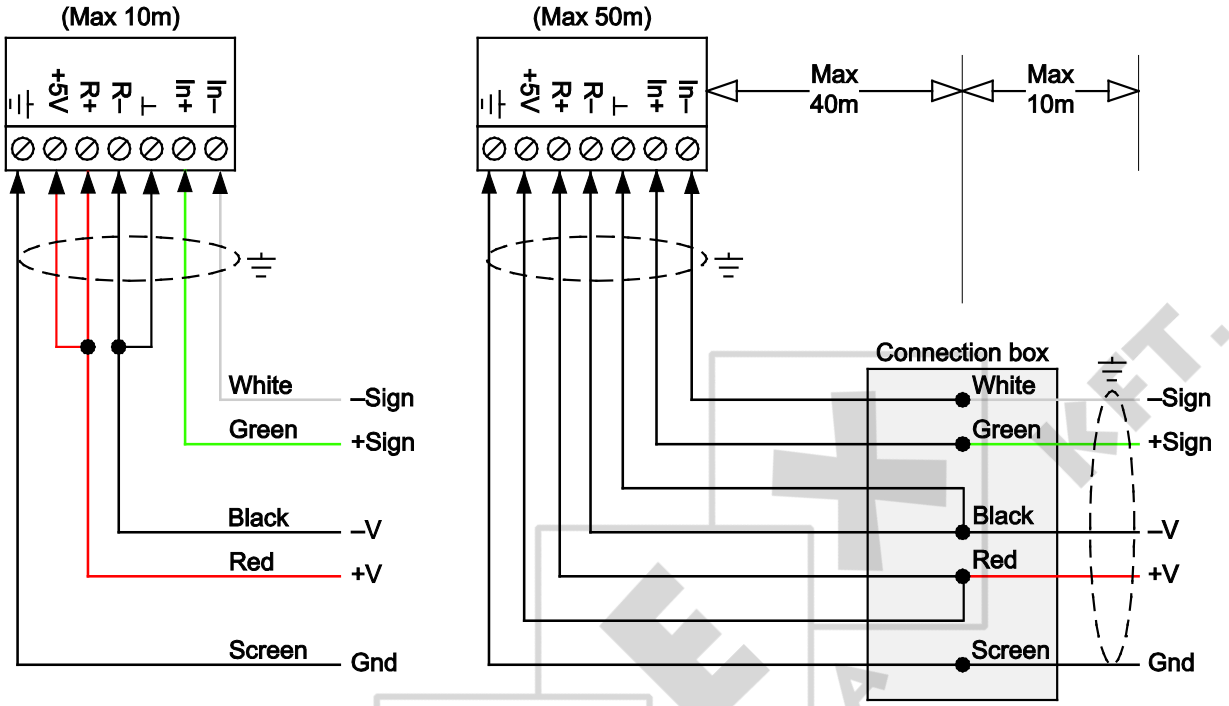
I2C address select fixed on address 3 (dipswitch 1-2 on OFF)

C Weigh input 1

D Weigh input 2 (not used)

6.4.1 Extending load cell cable

The standard cable from the load cells to the Lumina 47 is 10 metres. This cable can be lengthened by maximum 40 metres. When lengthening the cable, follow the diagram below. The standard 4-core cable is lengthened using a 6-core cable as shown in the diagram.



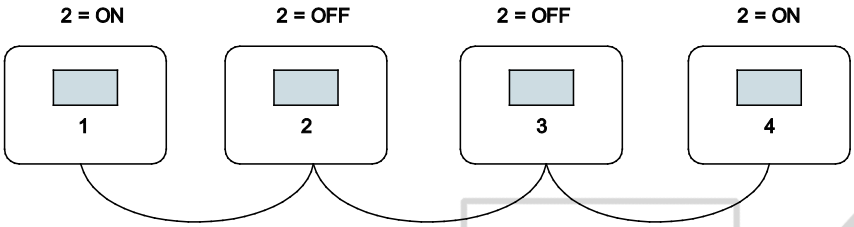
6.5 Connection FNet and I/O-net

Use of the terminal resistor depends on the location of the control computer in the FNet or I/O network. Looped control computers do not require a terminal resistor.

Control computers or end stations at the beginning or end of the network require a terminal resistor. Depending on the device type a 120 Ohm resistance, a jumper or a dipswitch is used to terminate the control computer.

Example: Setting the terminal resistor FNet

Four control computers connected using FNet.

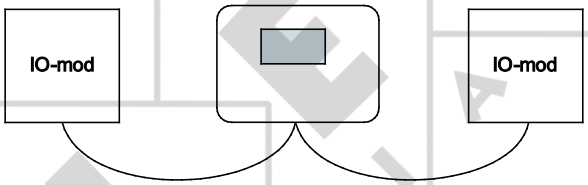


Control computers 1 and 4 are at the end of the network. These control computers must be terminated.

Control computers 2 and 3 are looped. These looped control computers do not require a terminal resistor.

Example: Setting the I/O-net terminal resistor (1)

One control computer connected to two I/0 network modules using one I/O-net.

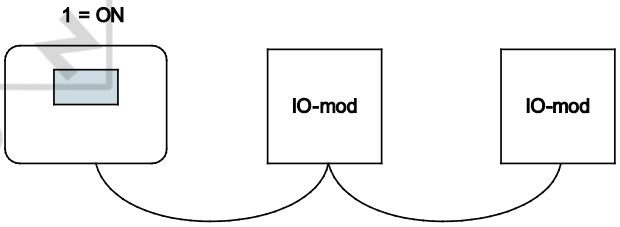


The control computer is located between the two I/O network modules. This does not require a terminal resistor.

Both I/O network modules are at the end of the network. These must be terminated.

Example: Setting the I/O-net terminal resistor (2)

One control computer connected to one network module using one I/O-net. This I/O network module is linked to a second I/O network module.



The control computer and the second I/O network module require a terminal resistor.

The first I/O network module is looped. This does not require a terminal resistor.

The Fancom Greenlink cable (UTP 1x2x0.8mm, unshielded twisted pair) used to wire the FNET and I/O net. Maximum cable length = 1200 meters.

Connect each Fancom device according to the applicable legislation/regulations of the local energy provider.

7. Appendix: EG declaration of conformity

Manufacturer: Fancom B.V.

Address: Industrieterrein 34

City: Panningen (the Netherlands)

Hereby declares that the: **Lumina 47**

Complies with the provisions of the:

1. Low voltage directive 2006/95/EC
   according to NEN-EN-IEC 61010-1: 2010
2. EMC directive 2004/108/EC
   Emission according to NEN-EN-IEC 61326-1: 2013
   Immunity according to NEN-EN-IEC 61326-1: 2013

Place: Panningen Date: 01-04-2014

Paul Smits

Managing Director