GB

IMS manual





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Always keep this manual by your network module

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K.

EC Declaration of compliance

Manufacturer

Fancom B.V.

Address

Industrieterrein 34

City

Panningen (the Netherlands)

hereby declares that the IMS

Satisfies the conditions set out in:

- 1. The Low Voltage directive 2006/95/EC According to EN-61010
- 2. The EMC directive 2004/108/EC Emission according to NEN-EN 61000-6-3:2001 Immunity according to NEN-EN 61000-6-2:2001

Place: Panningen

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About this manual

This manual has been written for the network module installer and user and contains information about the installation and working of the network module. This manual also contains information concerning network module service.

For the installer

Read this manual carefully and follow all the safety instructions. The installer settings can then be made and the network module prepared for further use.

For the user

This manual also contains a section for the user. It contains information about the daily use of the network module.

If you have any questions, please do not hesitate to contact Fancom. 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 Fancom IMS is an Intelligent Actuator Module to be used in combination with a Fancom climate controller in the agricultural sector.

This IMS controls a Fancom actuator. Control is based on the potentiometer feedback (4K7) of the actuator.

IMS in I/O-Network

An IMS in an I/O-Network has more possibilities. In addition to the control mentioned above, temperature measurement is also possible. The Fancom climate controller can use this input.

If I/O-network communication fails, the IMS controls the air inlet position to the last received setting, based on the IMS temperature measurement. The Fancom climate controller must communicate this setting to the IMS. Refer to the description of the Fancom climate controller concerned.

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2. Technical specifications

Power supply					
Mains voltage		1-phase: 230Vac (-10%, +6%)			
		3-phase: 400Vac (-10%, +6%)			
Mains frequency			50/60Hz		
Fuse electronics (5 x 20m	nm.)	slov	v blown, 250V T50mA		
Max. power consumption	electronics		5VA		
Inputs					
Analog In		Voltage- or te	mperature measuring		
Voltage	e 0-10V, tempe	erature sensor t	ype S7 (-50 t/m 110"C)		
I/O-net			I/O-net		
PF (PowerFail)			Make-contact		
Position feedback motor		Potentiometer $4k7\Omega$ (+/- 20%)			
			Υ.		
Outputs					
Relay (2×)		1-phase:	230Vac, max. 4A		
		3-phase:	400Vac, max. 4A		
Limit switches	Contact (vol	tage free) 30\	/ac / 60Vdc – min. 1A		
Manual control	4				
Rotary switch		close-0	D-autO-open' control		
Housing					
Plastic housing with screw	v on lid		IP54		
Dimensions (Ixbxh)		1-phas	se: 180×240×140mm		
		3-phas	se: 300×240×140mm		
Weight (unpacked)			1-phase: 1,72 kg.		
			3-phase: 2,35 kg.		

Ambient climate

A5911573 - GB030409

0 to 40°C
-10 to +50°C
<95%, uncondensed

I/O-netwerk

Possibility of communication via the I/O-Network. One control computer and a maximum of 31 network modules may be connected to the I/O-Network. Each connected network module has a unique address. After an address has been changed, the network module should always be restarted (power off-on).

Table	1:	I/O-Addresses	for t	the	control	comp	uter
i anic	•••	1/0 /100/00000	101 1		00111101	connpe	acor

In-/output type	ITM address . sequence number
Analog measurement (temp.)	"ITM address" . 1
Air inlet position	"ITM address" . 2



3. Safety instructions and warnings

3.1 General

Read the safety instructions carefully before installing and/or using the network module. The installation of the network module 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 During installation



Caution

- 1. Take precautions to prevent electrostatic discharge (ESD).
- 2. Provide a clean and dry place to work.



Disconnect power before installation

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



Incorrect connections can cause permanent damage

3.3 During use



- 1. The network module is an electronic apparatus, possible malfunctioning cannot therefore be excluded.
- 2. Check the network module regularly for any damage. Any eventual damage should be directly reported to your installer.



A damaged network module is dangerous!

3. Do not use running water (high pressure cleaners) to clean the network module.



The network module is water resistant, not waterproof!

4. Important!

It is advisable not to switch off the network module. This could lead to condensation caused by cooling down.



4. Mounting and installation

Observe the following points when mounting/installing the network module:

1 Disconnect power before installation

- 1. Use the cables mentioned in the instruction diagrams and follow all instructions.
- 2. Never mount the network module in a place where the weather has direct influence; not in direct sunlight or in places where the temperature can rise sharply etc.
- 3. Never mount the network module in the section itself because of the (manual) operation.
- 4. Mount the network module on a flat surface, the gland nuts should be at the bottom of the module.
- 5. Mount the network module at a convenient height for manual operation.
- 6. Seal all gland nuts after connection to prevent the entry of dust, humidity and/or aggressive gases.
- Always observe the regulations of the electricity company.



5. Possibilities IMS

An IMS controls a $1 \sim$ or $3 \sim$ Fancom actuator. Control is based on the potentiometer feedback (4K7) of the actuator.

The required air inlet position is determined by the I/O-net control or a 10-0V (or 0-10V) control signal from a control computer.

If the IMS is controlled via an I/O-Network, the IMS has more possibilities. The analog input can be used for temperature measurement and the air inlet position can be read out.

5.1 Pre-defined position / independent control

In certain problem situations the IMS can control the air inlet position independently. A pre-definable position is settable, the standard factory setting is 50%. If the IMS controls independently, a "U" appears on the 7-segment display.

No control signal (voltage)

If the control signal fails, the air inlet will open fully (10-0V control signal) or close fully (0-10V control signal).

No control signal (communication)

If communication with the control computer fails, the following will happen. If an individual temperature sensor has been connected to the IMS and the control computer was able to communicate the temperature setpoint and the control range to the IMS, the IMS will control independently based on the last received setpoints. If this is not possible, it will control the air inlet to the pre-defined position.

IMS



Attention! Not all control computers can communicate these settings. Check the manual of the control computer concerned first.

Power out

If the input of the 'power fail' (PF) detection activates, the IMS will control the air inlet to the pre-defined position - if the correct emergency power supply has been connected.

6. Switch

The front of the IMS has a 5-position switch. The position of the switch determines the function of the actuator. (see Figure 1).



7. DIP-switches

DIP-switches 1 thru 5 -type control

DIP-switches 1 thru 5 determine the type of control. If an I/O-net is used an address between 131 should be set to identify the IMS to the connected control computer. If an analog (0-10V or 10-0V) control is used, the DIP switches should be all be set to ON.

DIP-switch 6 – Temperature sensor readout

If the IMS measures the temperature itself via a sensor connected to the IMS, DIP-switch 6 should be set to OFF.

8. 7-segment display

The IMS has a 7-segment display (see figure 2). This indicates the possible program status.

- 1. Adjusting maximum air inlet position.
- 2. Adjusting minimum air inlet position.
- 3. Adjusting pre-defined air inlet position successful.
- b. Busy determining a stable position within the control procedure. (Busy)
- E. Error during determining a stable position within the control procedure. (Error)
- c. Adjusting maximum air inlet position successful. (Close)
- O. Adjusting minimum air inlet position successful. (Open)
- P. Adjusting pre-defined air inlet position successful.
- U. Due to problems, the IMS is now controlling based on the predefined position or controlling independently based on setpoints.
- ≡ Potmeter value indication during adjustment minimum. Too high, good or too low.

An "A" in the display, followed by a number, indicates an alarm. The table below contains an alarm overview.

Alarm indication	Meaning
AO	Backup alarm
A1	Memory alarm
A2	Inlet position not reached within 10 min.
A3	Power failure
A4	I/O-net error; No communication with I/O-Net

9. Control

9.1 The IMS as I/O-network module

First set an I/O-address using DIP-switches 1 thru 5 (see figure. 2). In a single I/O-network all the I/O-network module must have a unique address.



The voltage input can be used as the temperature input if the I/O-net is used. Place the jumpers JP1 (see figure 2).

To be able to measure the temperature, DIP switch 6 must be set to 'OFF' (see figure 2). The connected temperature sensor can now be read out.

The IMS can also take over control in the event of communication problems. If the connected computer can communicate the setpoint and control range to the IMS, these values will be used for further control. The IMS will continue control based on the last received settings and the temperature it measured on the connected sensor. If DIP switch 6 is set to NO measurement or no settings have been communicated, the IMS will control using the value set as the pre-defined position.

Adjust the IMS according to the procedures described (see chapter 10).



9.2 The IMS as a traditional end station

If the IMS is used as a traditional end station, it is controlled by a voltage signal.

The voltage input should be used as an analog input. Remove jumpers JP1 (see figure 2). After these jumpers have been removed, the IMS can be used for 0-10/10-0Vdc control.

The control signal is on the same connection as any temperature sensor. In this case, no temperature sensor can be connected. If control is via a 10-0Vdc (or 0-10Vdc) control signal, DIP switches 1..5 must all be set to ON (see figure 2).

Adjust the IMS according to the procedures described (see chapter 10).

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10. Adjustment procedure

10.1 General

Before the IMS can be used, the minimum and maximum air inlet position must be adjusted first and if any emergency power supply is used also set the pre-defined position. The option on the 7-segment display is important here.

In order to guarantee accurate control, the air inlet range should be at least 30% of the total range of the actuator. Preferably use a control whereby at least 50% of the motor stroke is used. With smaller strokes it's advisable to reeve the cables, to increase the range of the motor.

Table 2: Position of the	7-segment	display	during	adjustment
--------------------------	-----------	---------	--------	------------

'Situation'	
Adjustment of:	Display
Minimum air inlet position	$1 \rightarrow b \rightarrow C / E$
Maximum air inlet position	$2 \rightarrow b \rightarrow 0 / E$
Predefined position	$3 \rightarrow b \rightarrow P / E$

Open the cover of the IMS housing.



10.2 Air inlet minimum / maximum

10.2.1 Adjusting air inlet minimum

With 0-10V or 10-0 V control, ensure that the analog output of the connected outputs 1%. This is unimportant with an I/O-net controlled system.

Method 1% adjustment

- 1. Press the BUTTON for about 2 seconds until number "1" appears on the 7-segment display. The IMS is now in the 1% adjustment mode.
- Close the air inlet manually by setting the switch on the IMS to the CLOSE position. This must happen within 10 minutes, otherwise calibration will be interrupted and the display 'cleared'.
- 3. When the air inlet is fully closed turn the potmeter completely anticlockwise using a screwdriver until it cannot be turned any further. Then turn it a fraction clockwise to get it out of the so-called "dead band". The following will appear on the 7-segment display:

Signal too high, turn potmeter further to the left.

Signal too low, turn potmeter further to the right.



Signal O.K., proceed with the next step.

Poss. check: measure the voltage over the clamps at the (0,1..0,4V)

- Press the BUTTON to confirm the minimum position; "b" (busy) will appear on the display. If this does not happen within 10 minutes, the adjustment procedure will be interrupted.
- 5. When the value for the closed position has been determined, this will be compared to the value of the open position. For accurate

control of the inlet position, the difference must be a minimum of 30% of the range.

As soon as "C" (close) appears on the 7-segment display, minimum adjustment is successful.

If "E" (error) appears on the 7-segment display this indicates that the mutual difference is too small. Adjustment was not successful. In this case, it is usually the maximum air inlet position that is the problem. This should first be adjusted before the minimum position is adjusted again.

10.2.2 Adjusting air inlet maximum

With 0-10V or 10-0 V control, ensure that the analog output of the connected control computer outputs 99%. This is unimportant with an I/O-net controlled system.

Method 99% adjustment

- 1. Press the BUTTON for about 2 seconds until "2" appears on the 7segment display.
- 2. The IMS is now in the 99% adjustment mode.
- 3. Open the air inlet manually by setting the switch on the IMS to the OPEN position. This must happen within 10 minutes, otherwise calibration will be interrupted and the display 'cleared'.
- 4. Press the BUTTON to confirm the maximum position; "b" (busy) will appear on the display. If this does not happen within 10 minutes, the adjustment procedure will be interrupted.
- 5. When the value of the open position has been determined, this will be compared to the value of the closed position. For accurate control of the inlet position, the difference must be a minimum of 30% of the range.
- 6. As soon as "O" (open) appears on the 7-segment display, this indicates that the maximum adjustment was successful.
- If "E" (error) appears on the 7-segment display this indicates that the mutual difference is too small. Adjustment was not successful.

10.2.3 End of adjustment procedure minimum and/or maximum

Set the switch on the IMS to the AUT position. If the switch is not set to AUT, the programme will shut down after max. 10 minutes anyway.

10.3 Predefined position

Method predefined adjustment

- 1. Press the BUTTON for about 2 seconds until number "3" appears on the 7-segment display.
- 2. Set the air inlet manually to the required position using the switch on the IMS. This must happen within 10 minutes, otherwise calibration will be interrupted and the display 'cleared'.
- 3. When the required air inlet position has been reached, press the BUTTON to confirm the position. "b" (busy) will appear on the display. As soon as "P" (predefined) appears on the 7-segment display, predefined adjustment is successful. This must happen within 10 minutes, otherwise adjustment will be interrupted



Connection diagram IMS 1-Phase



Connection diagram IMS 3-Phase



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

Connection I/O-Network

one control computer and max. 31 network modules



The order of network modules is not important.



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