

Controllers ELP14R18

Inverters with Modbus control:

Danfoss FC51, Danfoss FC101, LG IC5, LG IG5, EC Blue, EBM, Eura Drive



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1. General information



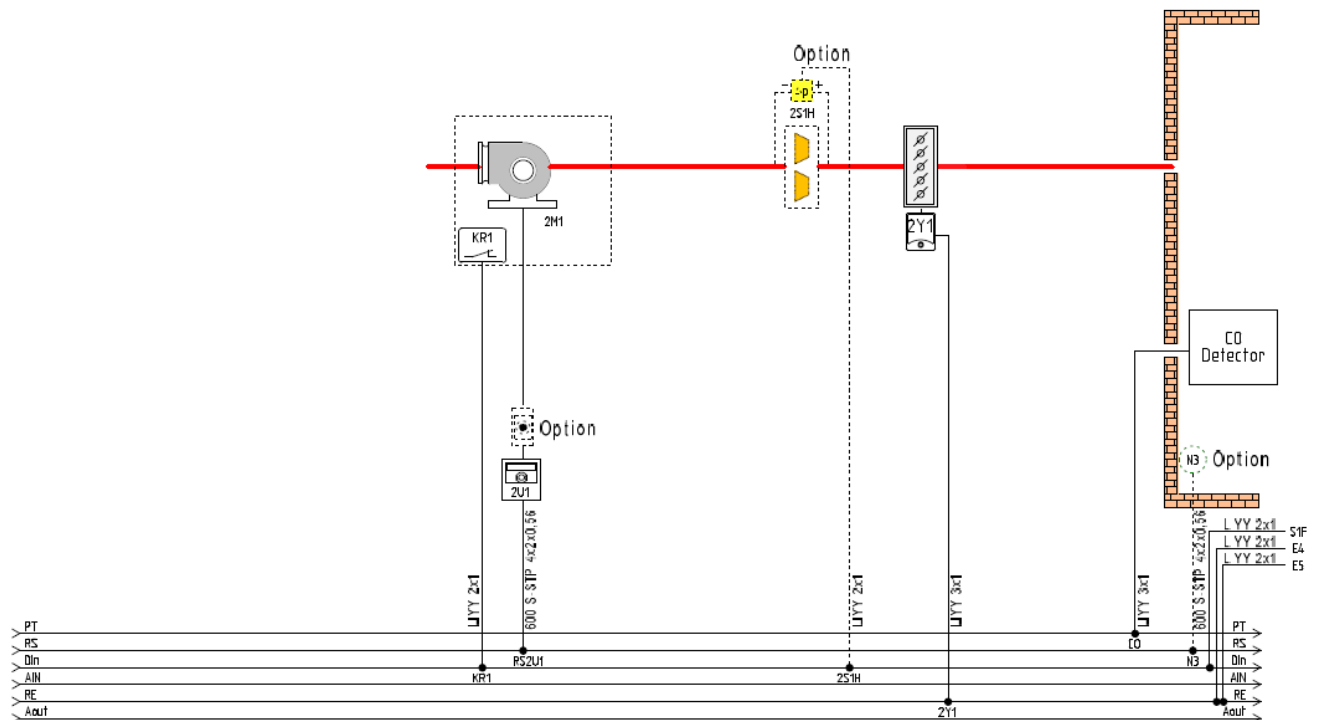
The control box can be handled by untrained personnel.

EL-...-...-...-... controller conforms with requirements of the following standards:
PN-EN 61439-1:2011, PN-EN 61439-3:2012, PN-EN 61000-6-1:2008, PN-EN 61000-6-3:2008

Intended use

- Supply, Double Supply or Supply and Reserve Supply Air Handling Units
- Exhaust, Double Exhaust or Exhaust and Reserve Exhaust Air Handling Units, cooperation with 2 steps detector.

Example: MED-W



2. Encryption of control boxes

Type
N – supply
2N – double supply
NR – supply + reserve supply
W+DET – exhaust + detector
2W+DET – double exhaust + detector
WR+DET – exhaust + reserve exhaust + detector

3. System operations

Tab. 1. The functions of the Air Handling Units.






Functionality	Triggering condition	Description
Starting fans in ventilation mode	- set the mode 1 gear, 2 gear, CALENDAR	- The opening external damper - Enabling the fan motor on chosen gear
Starting fans in CO detection mode	- set the mode Stop-auto - detector CO (Alarm 1)	- The opening external damper - Enabling the fan motor on first gear
	- set the mode Stop-auto - detector CO (Alarm 2)	- The opening external damper - Enabling the fan motor on second gear

4. Symbols and wiring

The elements of automation should be installed in accordance with application scheme and the following standards:

- control cables type LIYY, LIYCY (do not use twisted-pair cable as control cables) and control cables type YLY and communication cables PROFIBUS DP typ BUS O2YS(St)CY 1×2×0,64/2,6 mm should be wired according the chart presented in electric chart and technical demands of this application,
- cables' cross-sections were chosen to be installed in 100m long metal cable tray,
- in order to communicate adjuster, inverter and BMS it has to be used wires type shielded - shielded twisted pair (each pair is twisted and shielded and all together are shielded), type PROFIBUS DP typ BUS O2YS(St)CY 1×2×0,64/2,6 mm,
- there is not allowed to put cables responsible for communication together with control cables and power supply cables. For communication cables needs to be provided separate cable routes,
- inverter should be installed not more than 100m away from the controller,
- HMI panel should be installed not more than 100m away from the controller,
- there is not allowed to use one cable simultaneously for more than one function/equipment. There is an obligation for each hardware/function to have autonomic cable,
- there is not allowed to use twisted-pair cable as control cables for signals on/off 24V, 230V, 0-10VDC.

Tab. 3 Cables description.

Type of the wire	Draw	Description	Description
(1)		Multiple strand cable with copper strands in PVC jacket	Nominal voltage: 450/750V Operating temperature: -40 do 70°C
(2)		Cables with multiple, flexible copper strands in PVC jacket	Nominal voltage: 450/750V Operating temperature: -40 do 70°C
(3)		Communication cables (PROFIBUS DP typ BUS O2YS(St)CY 1×2×0,64/2,6 mm) with copper strands, screened with copper wires, in PVC jacket	Nominal voltage: 100V Operating temperature: - 30 do 70°C
(4)		Cables with multiple, flexible copper strands, screened with copper wires, in PVC jacket	Nominal voltage: 450/750V Operating temperature: -40 do 70°C
(5)		Power cable with copper strands, screened with copper wires, in PVC jacket	Nominal voltage: 450/750V Operating temperature: -40 do 70°C

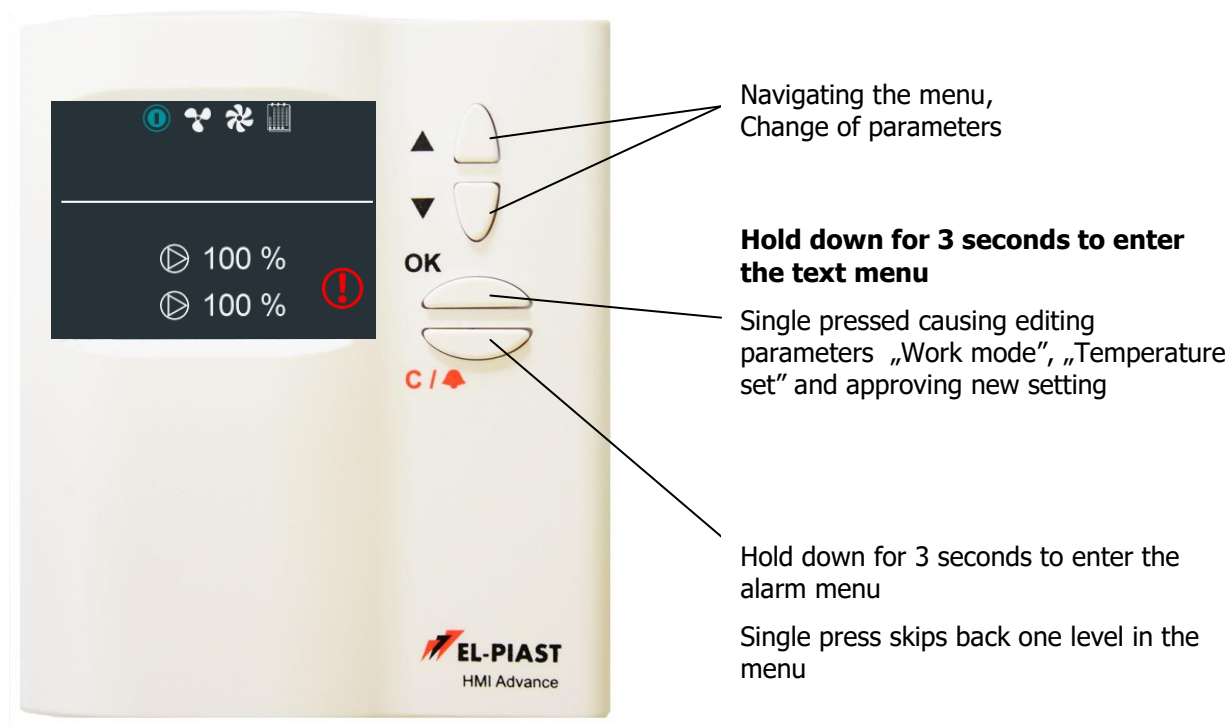
Power cables for the control box, pumps and fan motors shall be installed in accordance with the scheme and wiring list. Cable dimensions were selected based on long-term power load assumption accordance with the standard EN/PN-IEC 60364-5-523.

Tab. 4 The standard cable list and symbols of schemes.

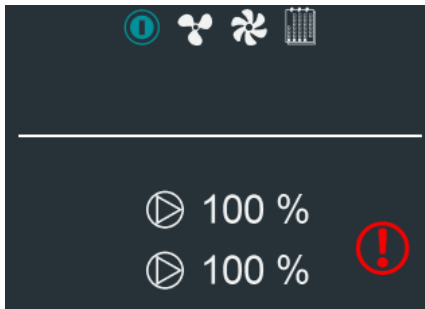

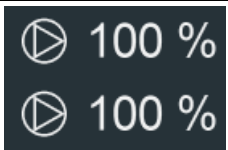

Symbol from the application schema	Description	Typ of the wire	Number of x cross - section in mm ²
S1F	Cooperation with the station controller fire-protective	-	-
KR1	limit switch compartment fan 1	(2)	2x1
KR2	limit switch compartment fan 1	(2)	2x1
FM1	Protecting the circulation pump of the water heater	-	-
F2M1,2	Protecting the exhaust engine	-	-
2U1,2	Connecting powering the ventilator for inverters	(5)	Attachment B
2M1,2	Connecting powering the engine of the team of the fan	(1)	Attachment B
RS2U1,2	Modbus RS485 signal for inverters	BUS O2YS(St)CY	1×2×0,64/2,6
2Y1	Actuator of the dumper of air	(2)	3x1
2Y2	Actuator of the dumper of air (reserve part)	(2)	3x1
2S1H	Differential pressure switch of filter	(2)	2x1
2S2H	Differential pressure switch of filter (reserve part)	(2)	2x1
CO Detector	Alarm 1 and alarm 2 signals od CO detector	(2)	3x1
E.A2	The signal indicating the alarm currently occurring CO 2 detector (warning sign)	(2)	2x1
E5	Confirming the start – dry contact NO	(2)	2x1
E4	Collective alerting signal – dry contact NO	(2)	2x1
N1	Controller	-	-
N2	Panel HMI Tiny	(4)	7x1
N3	Panel HMI - 216 Advance (max 100m) – communication	BUS O2YS(St)CY	1×2×0,64/2,6
	Panel HMI - 216 Advance (max 100m) – power supply	(2)	2x1

5. HMI and Controller specification

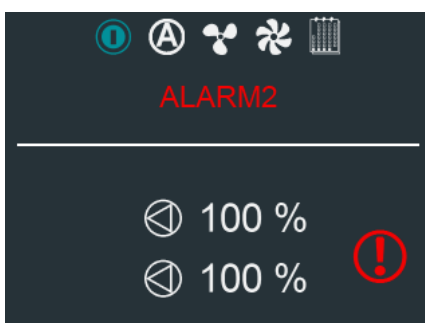


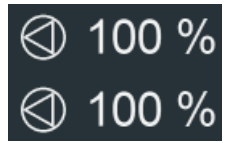

HMI Advance



Main menu icons (N, 2N, NR):

		Setting the operating mode: „Stop“, „1 gear“, „2 gear“, „Calendar“
		Activation of 1 st or 2 nd fan
		The summary alarm activated

Main menu icons (W+DET, 2W+DET, NR+DET):

		Setting the operating mode: „Stop“, „Stop-Auto“, „1 gear“, „2 gear“, „Calendar“
		CO Detector Alarm
		Activation of 1 st or 2 nd fan
		The summary alarm activated

After pressing "OK" (about 1 second) display changes to the text menu of the operating system automation.

Single pressed causing editing parameters „Work mode“, „Temperature set“ and approving new setting.

After longer time holding down the keys „▲“ and „▼“ at the same time (about 3 seconds), display changes to the display's setup menu.

HMI parameter description:

Minimal brightness – minimal brightness of the highlight

Maximal brightness – maximal brightness of the highlight

Activity time – time of activity, after this time the display is dimmed

After activity time – action undertaken after activity time (1. nothing, 2. if alarm occurred, than go to alarm menu, else go to the first chart of main menu).

T sensor offset – the adjustment of the temperature sensor measuring in the HMI

Menu skin – Skin selector of the HMI

Communication settings – communication settings menu of the HMI and RS485 Master interface settings of the ELP controller

To exit menu - press C key.

Panel Advance HMI can be connected to the input of the HMI CON (located at the upper side of the driver around the USB connector) or RS485 master (if it is not used to transfer information management system BMS). There is a possibility of simultaneous connecting two panels to the RJ45 connector and RS485 Master. If a sensor leading temperatures is a sensor in panel check HMI whether there is a chosen sensor leading Adjusting/temperature/sensor in accordance with connecting on the menu.

Panel HMI Advance has a jumper "simple/ext" which the opening causes the work for panel with the partly hidden menu, this function won't let the service of the object the entry in "service menu" where we are making the configuration of the ventilation arrangement in.

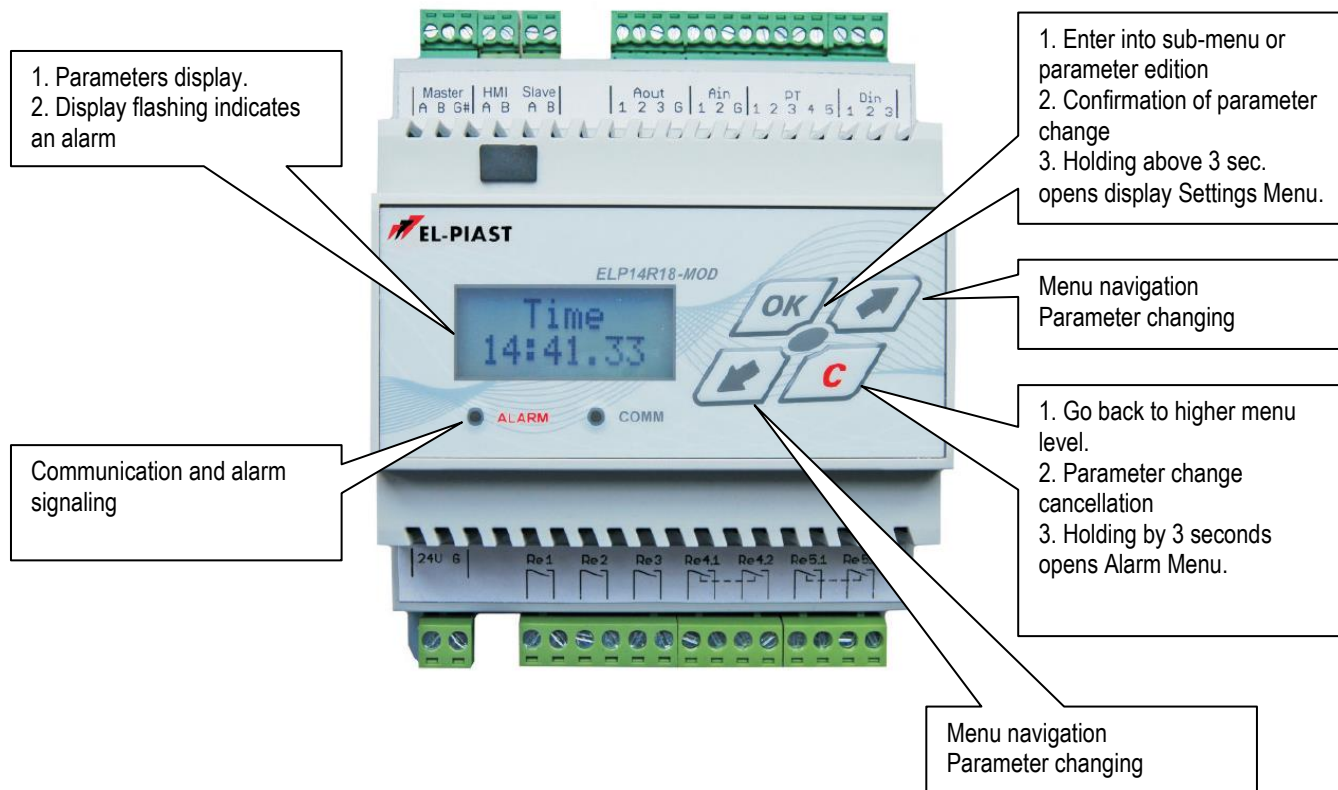
On the controller screen ELP... the function „simple/ext“ is inactive.

The USB connection is used to download the application control.

If the application does not meet the control requirements of the customer, contact the manufacturer or supplier, you can adapt to the requirements of the application and upload it using any PC.

ELP14R18-Mod – communication Modbus RTU with BMS through the RS485 (connector RS485 Master)

ELP14R18-Bac – communication with BMS through the BACnet MS-TP (connector RS485 Master)



Longer holding of OK button (more than about 3 seconds) display enters Display Settings Menu.

Parameter description:

Contrast – display contrast

Minimal brightness – minimal brightness of the highlight

Maximal brightness – maximal brightness of the highlight

Backlight time – time of activity, after this time the display is dimmed

After backlight time – action undertaken after activity time (1. nothing, 2. if alarm occurred, than go to alarm menu, else go to the first chart of main menu).

Master bus speed – RS Master speed setting (9600)

Modbus address – MAC address of the Modbus

To exit menu - press C key.

Panel Advanced HMI can be connected to the input of the HMI CON (located at the upper side of the driver around the USB connector) or RS485 master (if it is not used to transfer information management system BMS). You can simultaneously connect two room units HMI CON connector and RS485 master - in this case we can not connect the controller with the BMS facility.

Panel HMI Advanced has a jumper "simple / ext" the opening adjuster will work with partially hidden menu, this function will use the object to enter the "Service menu" in which we make the ventilation system configuration.

The menu driver is always visible in its entirety.

The USB connection is used to download the application control. If the application does not meet the control requirements of the customer, contact the manufacturer or supplier, you can adapt to the requirements of the application and upload it using any PC.

5.1. Service menu - configuration

Panel HMI Advance has a jumper "simple/ext" which the opening causes the work for panel with the partly hidden diet, this function won't let the service of the object the entry in "service menu" which we are making the configuration of the ventilation arrangement in.

The access to the service menu protected is a password (default: **1111**).

The configuration of the arrangement with the service menu consists on:

- 1) change of the type of the Air Handling Unit (Supply, Double Supply or Supply and Reserve Supply , Exhaust+detector, Double Exhaust+detector or Exhaust and Reserve Exhaust+detector)
- 2) accessing menu and configuration:
 - Starting time** – the ability to set the time after which the system can start working
 - Fan inverter type** – the possibility of choose fan inverter type controlled by Modbus RS485 (LG IC5, IG5, Danfoss FC51, Danfoss FC101, EC Blue, EBM, Eura Drive)
 - EC Blue** – possibility of setting the Modbus address of the speed controller built into the EC motor.
 - EBM** – possibility of setting the Modbus address of the speed controller built into the EC motor.
 - Contact work** – there is an ability to active one of the relay output as a confirmation of work (make sure that the output is not used for other purpose in the application).
 - Contact alarm** – there is an ability to active one of the relay output as a collective alarm (make sure that the output is not used for other purpose in the application).
 - Vent.1 0-10VDC** – the possibility of activation of one of the analog outputs as a signal 0-10VDC airflow rate of the 1st air fan (make sure the output is not used for other purposes in the application)
 - Vent.2 0-10VDC** – the possibility of activation of one of the analog outputs as a signal 0-10VDC airflow rate of the 2nd air fan (make sure the output is not used for other purposes in the application)
 - Tcom** – communication time with one frequency inverter
 - Twait** – response time for communication with all frequency inverters

After the configuration of the arrangement one should switch the service mode on DISABLED and to conduct the activating procedure of the arrangement.

- 1) connect and configure frequency inverters.
- 2) check the correctness of connections and the reaction of inputs/outputs to the state of detectors, switching inputs elements and executing outputs elements.
- 3) fill up the activating card of the system and permanently fasten the copy of the card to the control box (attachment D)

The service menu has options of the emulation of inputs and forcing outputs. For the correct work of the system emulation and forcing functions must be disabled.

5.2. Standard functions of controller's inputs/outputs

Digital inputs (State of the NC access - giving for accessing DIN... enclosing the digital input causes stretching 24 VAC)		During the correct work of the arrangement	The lack of the required state is causing alarm
Din 1	Fire central	compact	A_StopSystem
Din 2	Work permit - limit switch compartment fan .	compact	A_OpenVent
Din 3	Differential pressure switch of filter	obtuse	A_Filter

Temperature sensors PT1000		The compact input with GND is causing
PT1	CO detector – alarm 1	Work on 1 st gear
PT2	CO detector – alarm 2	Work on 2 nd gear
PT3	-	-
PT4	-	-
PT5	-	-

Digital outputs , excluded state - ReC/ReA exit obtuse, attached state - ReC/ReA exit compact		
Re1	Work	relay
Re2	Alarm	relay
Re3	CO detector – alarm 2 (light warning LED)	relay
Re4.1	Damper of the supply/exhaust 1	relay
Re4.2	Damper of the supply/exhaust 3 (shared part in reserve system)	relay
Re5.1	Damper of the supply/exhaust 2	relay
Re5.2	Damper of the supply/exhaust 3 (shared part in reserve system)	relay

Analogue outputs devices (Signal outputs devices 0-10VDC)	
Aout1	Ventilator 1
Aout2	Ventilator 2
Aout3	-

In the service menu you can activate any relay outputs as proof of works or collecting alarm. When activated, make sure that the output is not used in the application.

6. Control service

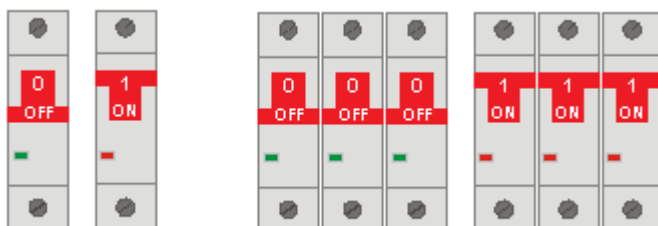


Before start-up by the user the control box should be connected and checked by authorized personnel.

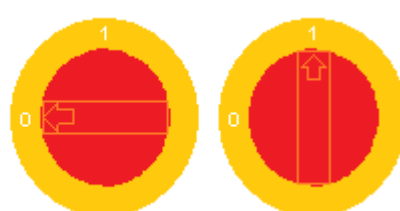
Start-up of the device

Operate Switch Q1M into position ON.

„1-ON” (synthetic switchboard)



„1” (metal switchboard)



The device is starting-up if:

- isn't appear neither of the alarms of the locking operation of the system and
- parameter **„Set work mode”** on the controller or on the HMI is set to any option other than **Stop**.

ATTENTION: After the power supply disruption, the system automatically returns to work with the last used settings (settings before the power supply disruption).

6.1 Alarms

Alarms are indicated by display flashing and red continuous lighting LED on the controller or HMI.

Information on the alarm can be read from **„Alarm Menu”**. Entering Alarm menu – by holding pressed of „C” key during about 3 second.

In case of blocking alarm, it is necessary to reset the alarm before restart of automation system will be possible. To reset the alarm one should enter Alarm Menu, choose proper alarm and hold OK. button for some time. If the source of the alarm is still active, the alarm will be supported and „*” symbol will appear at its description, denoting confirmation of the alarm. If source of the alarm have passed or will pass after confirmation of the alarm, alarm will be reset.

List of alarms

ALARMS	Alarm type	System reaction
Digital input		
A_StopSystem	Blocking	<p>Cooperation with fire alarm control panel.</p> <p>Alarm is OFF – lack of fire, on digital input appeared signal 24VAC Alarm is ON – fire appeared, on digital input doesn't appeared signal 24VAC</p> <p>Reaction on alarm ON: system is stopped until the fire won't be eliminated; after the fire is extinguished system is coming back to the working mode (state before</p>

		alarm).
		Digital inputs Din1
A_OpenVent	Blocking	<p>Protection work in an open chamber fan</p> <p>Alarm is OFF – on digital input appeared signal 24VAC Alarm is ON – on digital input doesn't appeared signal 24VAC</p> <p>Reaction on alarm ON: system is stopped until the chamber fan won't be closed; after the closed you have to confirm alarm).</p> <p>Digital input: Din2</p>
A_Filter	Declining	<p>Study the degree of contamination of the air filter with switch:</p> <p>Normal state - dirty limit, the pressure difference before and after the filter is below the set on the pressure switch, the digital input signal is not 24VAC Alarm conditions - dirt unacceptable pressure difference before and after the filter is above the set on the pressure switch, the digital input signal is 24VAC</p> <p>Responding to an alarm condition: the system works, it is a dirty filter alarm is displayed in the case of an alarm should immediately replace the filter with a new one, work with a dirty filter reduces the expenditure control and may cause it to rupture which can lead to contamination and damage to the heat exchanger / cooling from the customer's fault</p> <p>Digital inputs Din3</p>
Other Alarms		
A_FC1,2	Blocking	<p>The test proper operation of the inverter fan with inverter alarm contact (confirmation of work by Modbus RS485 communication):</p> <p>Normal state - immediately after the power is not an alarm inverter Alarm conditions - directly after the power inverter alarm occurs</p> <p>Responding to an alarm condition: the system is stopped, check the inverter and how to connect the controller and the fan, determine the cause of the error, and the cause of the alarm must be acknowledged and operate the system</p> <p>Modbus RS485 Slave communication</p>
A_In_Emulation	Declining	<p>Emulation of inputs:</p> <p>Normal state - there is no alarm, no input is in emulation mode Alarm state - at least one of the digital inputs, analog, PT1000 is in emulation mode</p> <p>Responding to an alarm: the driver does not react to physical changes emulated input, the system works to the value of the emulator in the service menu</p>
A_OutForce	Declining	<p>Forcing output:</p> <p>Normal state - there is no alarm, no output is in forcing Alarm state - at least one of the digital outputs, analog mode is forcing</p> <p>Responding to an alarm condition: the system works, however, forced output does not respond to the control algorithm, is set by the "force outputs" in the service menu</p>

Attention: Working in forcing or emulation mode can cause damage to the ventilation system caused by the user. Changes I/O in emulation or forcing mode should only be done by qualified and trained personnel.

Alarm reset

In case of blocking alarm, it is necessary to reset the alarm before restart of automation system will be possible. To reset the alarm one should enter Alarm Menu, choose proper

alarm and hold OK. button for some time. If the source of the alarm is still active, the alarm will be supported and „*” symbol will appear at its description, denoting confirmation of the alarm. If source of the alarm have passed or will pass after confirmation of the alarm, alarm will be reset.

7. Control operation

7.1 Main menu

Tab. 4 Main Menu

Name	Default value	Decription
State of the AHU	Service mode	<p>Service mode – the arrangement is in the course of the configuration, lack of ability of the start of the arrangement,</p> <p>Stop - the AHU is stopped, air dampers are closed , fans do not work,</p> <p>Alarm - stop – the AHU is stopped, an at least one blocking alarm is appearing, check the list of alarms, describe the reason for the failure, after repairing erase the blocking alarm</p> <p>Work 1,2 step - correct work on 1,2 step of fans</p>
Main menu	-	Choice of the work mode of AHU, states of the functioning of the fans
Calendar	-	Enables the programming of the calendar. Thorough description in the 7.2 subsection Calendar.
Settings	-	Parameters of the control system. Thorough description in the 7.3 subsection Settings.
Service menu	-	Enables the configuration of the AHU.
PL/EN/DE	-	Choice of the language menu (Polish/English/German).

7.2 Calendar

In Calendar options one can set date and time of real time clock. When operating mode is set at „**Calendar**” control will be realized according to recorded programs. Programs can cover a day or exceptions.

Program includes parameter :

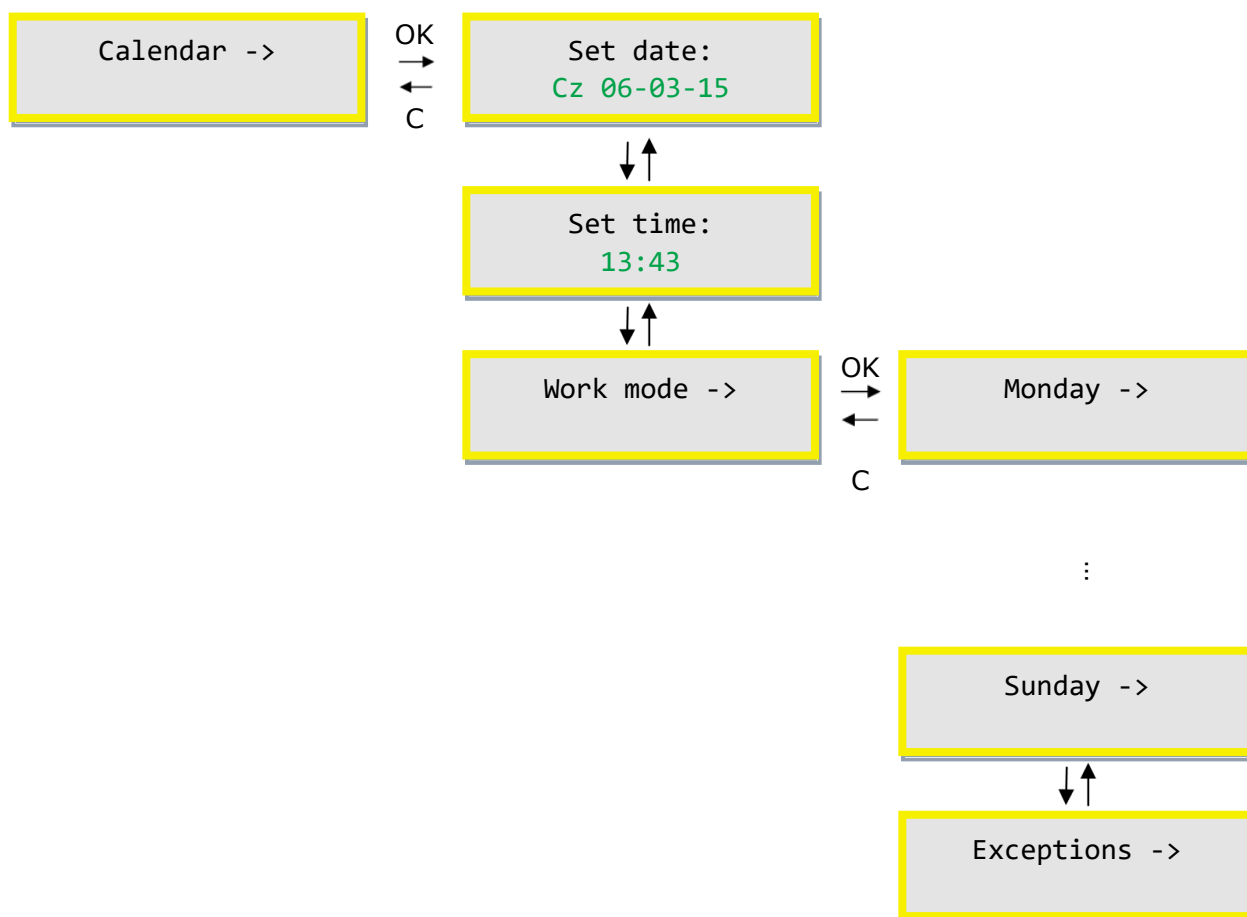
"N, 2N, NR"

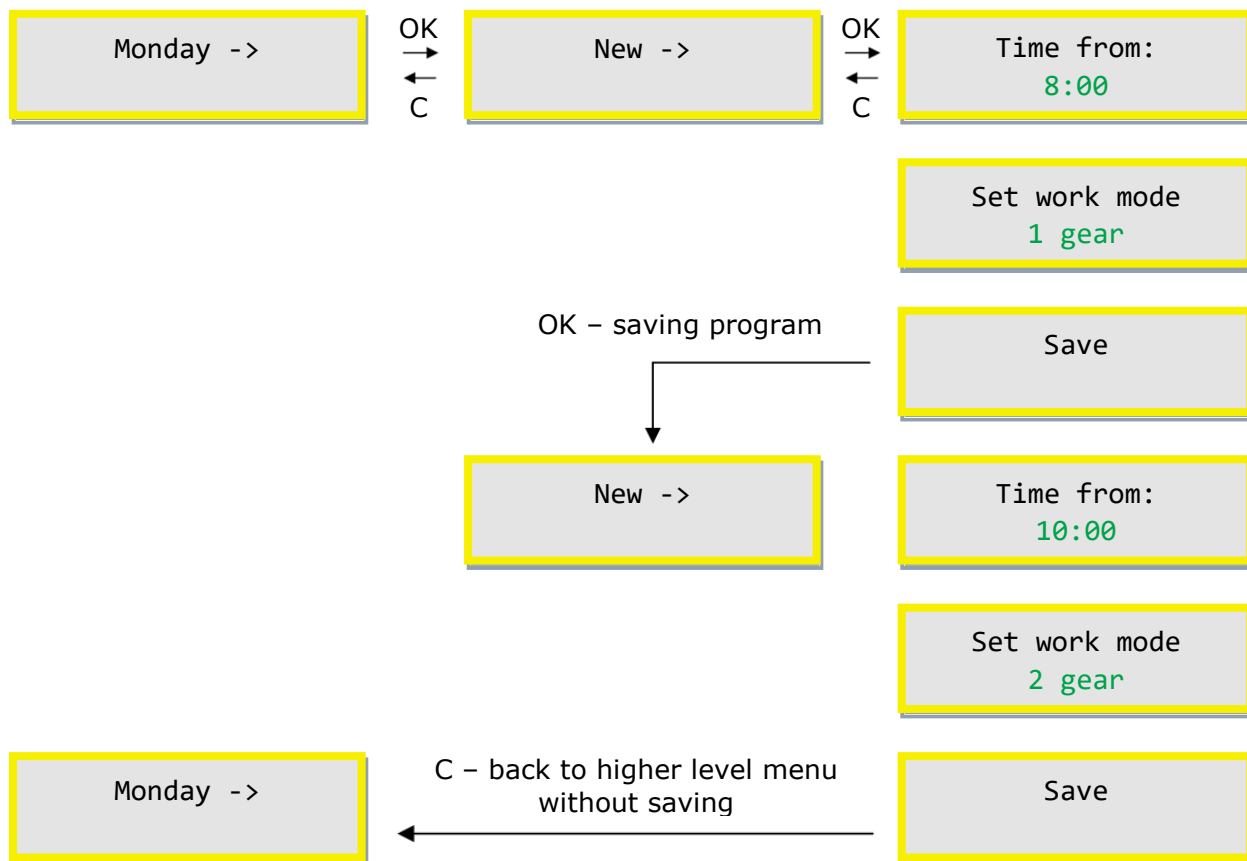
Work mode – possible selections: Stop, Start 1 step, Start 2 step.

"W+DET, 2W+DET, WR+DET"

Work mode – possible selections: Stop, Stop-Auto, Start 1 step, Start 2 step.

Calendar menu:



Work mode:


7.3 Settings

Access to the this settings is password protected (by default: **1111**).

Tab. 5 Settings menu.

Group	Name	Default	Description
Vent.	-	10 s	Starting delay - the time from the start throttle operation of the fans
		15 s	Damp.off delay - The time from switching on operation mode "Stop" and start stopping fans to start closing the air dampers actuators of the AHU
		30 s	Pressure delay - the time of operation of the fans after the pressure test on the filters.
		... %	Setting efficiency fan for 1,2,3 gear
	RS485	Active	Inv. via RS485 - activate communication with inverter fan 1
		Active	2. Inv. via RS485 - activate communication with inverter fan 2
		0 Hz	Freq.min. - setting the minimum frequency of the air fan, corresponding setting performance 0%
		60 Hz	Freq.max. - setting the maximum frequency of the air fan, corresponding setting performance 100% (the maximum frequency should be chosen according to DTR and performance measurement)
		1	Inv.address - address of the inverter 1 fan
		2	2.Inv.address - address of the inverter 2 fan
		60 s	T.acc. - start time inverters
		60 s	T.dec. - the time to stop the inverter
		0,3 s	Tcom - time communication with inverter
		2 s	Twait - waiting for a response in communication with the inverter

7.4 Service menu

Access to these settings is password protected (default: **1111**).

Tab. 6 Service menu

Name	Name	Default value	Description
Service mode	-	Active	<p>Active – possible configuration of the AHU, lack of ability of the start of AHU, protective functions of the chosen arrangement active</p> <p>Not active – configuration of the AHU is not possible, the possibility of the AHU start-up</p>
AHU type	Type	W+DET	<p>N – supply ventilator air control unit</p> <p>2N – doubled supply ventilator air control unit</p> <p>NR – supply + reserve supply ventilator air control unit</p> <p>W+DET – exhaust ventilator air control unit cooperation with 2 step detector</p> <p>2W+DET – doubled exhaust ventilator air control unit cooperation with 2 step detector</p> <p>WR+DET – exhaust + reserve exhaust ventilator air control unit cooperation with 2 step detector</p>
Configuration	Start time	10s	Start time – the ability to set the time after which the system can start working
	Fan inverter type	-	The possibility of choose fan inverter type controlled by Modbus RS485 (LG iC5, LG iG5A, Danfoss FC51, Danfoss FC101, EC Blue, EBM, Eura Drive)
	EC Blue	247	Current address - setting of the address currently set on the EC Blue fan
		-	Destination address - setting of the address required for the EC Blue fan (see Settings/Fans/RS485 table)
		No	Set address - load new address to the currently connected EC Blue fan (when performing this function, only one EC Blue fan should be turned ON, and after loading the settings, turn the EC Blue fan OFF and on again to enable the new address !!!)

		Ok	Status OK – loading settings successful Loading in progress - the system while loading settings, with correct communication the loading takes about 2 seconds Alarm – problem loading settings (addresses, communication error)
	EBM	1	Current address - setting of the address currently set on the EBM fan
		-	Destination address - setting of the address required for the EBM fan (see Settings/Fans/RS485 table)
		No	Set address - load new address to the currently connected EBM fan (when performing this function, only one EBM fan should be turned ON, and after loading the settings, turn the EBM fan OFF and on again to enable the new address !!!)
		Ok	Status OK – loading settings successful Loading in progress - the system while loading settings, with correct communication the loading takes about 2 seconds Alarm – problem loading settings (addresses, communication error)
	Work - contact	Inactive	Optional activation of the one of the relay outputs as work conformation (make sure that output is not already used by application)
	Alarm – contact	Inactive	Optional activation of the one of the relay outputs as a group alarm (make sure that output is not already used by application)
	Inverter 1 0-10VDC	Inactive	The possibility of activation one of the analog outputs as a signal 0-10VDC airflow rate of the air fan 1 (make sure the output is not used for other purposes in the application)
	Inverter 2 0-10VDC	Inactive	The possibility of activation one of the analog outputs as a signal 0-10VDC airflow rate of the air fan 2 (make sure the output is not used for other purposes in the application)
	Tcom	0,3s	Tcom – communication time with one frequency inverter

	Twait	2s	<i>Twait</i> – response time for communication with all frequency inverters
History of leading temperature	-	-	History of leading temperature which is written the last 15 measurements from the leading temperature sensor in the selected period of recording) and is given "deviation" which is the maximum difference of actual set point temperature and the last 15 measurements of the leading temperature sensor.
-	-	-	<i>Reading inputs, outputs of the controller, possibility of the emulation of inputs and forcing outputs of the controller during normal operation of the AHU, during the emulation or forcing activities alarm is reported but AHU is still normally working.</i>
Change the password	-	-	<i>Change of password of the access to the advanced options. Default password: 1111 Attention: losing, forgetting the password will cause loss of the possibility of amending of advanced parameters.</i>
Restore the default setting	-	-	<i>Restoring the initial values of all settings.</i>

8. Communication Modbus RTU

The controller has implementations of the Modbus RTU protocol. In order to make the network interface one should connect RS-485 trunk lines to the MASTER port on the slot of the controller. The Modbus address is being placed on ELP14R18 display as **MAC Address**. Longer holding of OK button (more than about 3 seconds) display enters Display Settings Menu.

Default parameters of the communication:

- MAC address 1
- transmission speed 9600 bps (possibility of amending from the level of inbuilt HMI or outside HMI)
- 8 bits of frame
- 2 bits of stop
- without parity

All variables are 32-bits with values of the type *Holding Register*. Modbus registers are 16-bits therefore one 32-bits variable is filling two 16-bits variables. The reading of variables is causing itself with Modbus 0x03 command, however writing single variable of the 16-bits using command of 0x06 or many variables with 0x10 command.

Read and write data type Input and Coil:

Each variable is a 32-bit value. For example, a variable with the address in the table 0x0008 provides bits at binary addresses $8 \times 32 \dots 9 \times 32 - 1$ for Input and Coil in Modbus standard.

Reading and writing data types Holding Register and Input Register:

The variables in this form for ease of integration with the BMS systems, are available in different address spaces.

- 0x0000 ... 0x1000 – traditional representation according information below
 - **Multistate** – listed integer variable values correspond to the states described
 - **Decimal** – 32-bit value of the variable is treated as an integer type with sign,
 - **Fixed** – where the 8 least significant bits are used for fractional part, while the remaining 24 bits are part of a signed integer. It follows that the accuracy of Fixed value is $1/256$. To scale the value represented in the Fixed form to the target (right), multiply it by $1/256 = 0,00390625$.
- 0x1000 ... 0x2000 – variable in Fixed format presented as an integer values without a fraction
- 0x2000 ... 0x3000 – variable in Fixed format presented as a values with accuracy to one decimal place in decimal format. The value of 20.67 is shown as 206
- 0x3000 ... 0x4000 – variable in Fixed format presented as a values with accuracy to tow decimal places in decimal format. The value of 20.67 is shown as 2067
- 0x4000 ... 0x5000 – just like in the 0x0000 ... 0x1000 but the variables are treated as 16-bit values. This means that the older 16-bit are not included. Addresses must be divided by two. For example, a variable from table with the address 0x0124 is available in 16-bit format at Modbus address 0x4092
- 0x5000 ... 0x6000 – just like in the 0x1000 ... 0x2000 but the variables are treated as 16-bit values. This means that the older 16-bit are not included. Addresses must be divided by two. For example, a variable from table with the address 0x0124 is available in 16-bit format at Modbus address 0x4092
- 0x6000 ... 0x7000 – just like in the 0x2000 ... 0x3000 but the variables are treated as 16-bit values. This means that the older 16-bit are not included. Addresses must be divided by two. For example, a variable from table with the address 0x0124 is available in 16-bit format at Modbus address 0x4092
- 0x7000 ... 0x8000 – just like in the 0x2000 ... 0x3000 but the variables are treated as 16-bit values. This means that the older 16-bit are not included. Addresses must be divided by two. For example, a variable from table with the address 0x0124 is available in 16-bit format at Modbus address 0x4092

Variables in the representation of Multistate and Decimal do not use in the address spaces 0x1000 ... 0x4000 and 0x5000 ... 0x8000 because it loses the least significant 8 bits of each of the variables.

Addresses in the table are converted to the Modbus protocol as follows:

Address space	Calculating an address
0x0000 ... 0x1000	Modbus Address = Address.
0x1000 ... 0x2000	Modbus Address = 0x1000 + Address
0x2000 ... 0x3000	Modbus Address = 0x2000 + Address
0x3000 ... 0x4000	Modbus Address = 0x3000 + Address
0x4000 ... 0x5000	Modbus Address = 0x4000 + (Address / 2)
0x5000 ... 0x6000	Modbus Address = 0x5000 + (Address / 2)
0x6000 ... 0x7000	Modbus Address = 0x6000 + (Address / 2)
0x7000 ... 0x8000	Modbus Address = 0x7000 + (Address / 2)

NOTE: You can not make a record of a single 16-bit register at address spaces 0x1000 ... 0x4000. In this case, write the registers in pairs using command Preset Multiple Registers (0x10) which consists of a full value of the 32-bit variable. This means that the address of the start of the recording and the number of registers must be an even number.

Main menu

Address DEC		Variable name	HMI Name	States	Type		Read [R] /Write [W]
BacNet	Modbus				BacNet	Modbus	
0	0	UnitState	Unit state	0: Stop, 1: Work 1 gear, 2: Work 2 gear, 4: Alarm stop, 8: Service mode	MSV	Register	R
1	2	WorkMode1	Set work mode	0: Stop, 1: 1 bieg, 2: 2 bieg, 4: Kalendarz	MSV	Register	R/W
2	4	WorkMode2	Set work mode	0: Stop, 1: Stop-auto, 2: 1 bieg, 4: 2 bieg, 8: Kalendarz	MSV	Register	R/W
3	6	Detector	Detector	0: No alarm, 1: Alarm 1, 2: Alarm 2, 3: Alarm 2	MSV	Register	R
4	8	Vent1	Vent.1	0: Off, 1: On	MSV	Coil 128	R
5	10	Pwr1	Vent.1	1% = 256 (22% = 22*256 = 5632 = 0x1600)	AV	Register	R
6	12	Vent2	Vent.2	0: Off, 1: On	MSV	Coil 192	R
7	14	Pwr2	Vent.2	1% = 256 (22% = 22*256 = 5632 = 0x1600)	AV	Register	R
8	16	I1	Current	1A = 256 (22A = 22*256 = 5632 = 0x1600)	AV	Register	R
9	18	F1	Frequency	1Hz = 256 (22Hz = 22*256 = 5632 = 0x1600)	AV	Register	R
10	20	RPM1	RPM	1rpm = 256 (22rpm = 22*256 = 5632 = 0x1600)	AV	Register	R
11	22	U1	Voltage	1V = 256 (22V = 22*256 = 5632 = 0x1600)	AV	Register	R
12	24	Fault1	Alarm code	1A = 1A (HEX) www.el-piast.com/alarms-decoder	IV	Register	R
13	26	Com1	Communication	1% = 256 (22% = 22*256 = 5632 = 0x1600)	AV	Register	R
14	28	I2	Current	1A = 256 (22A = 22*256 = 5632 = 0x1600)	AV	Register	R
15	30	F2	Frequency	1Hz = 256 (22Hz = 22*256 = 5632 = 0x1600)	AV	Register	R
16	32	RPM2	RPM	1rpm = 256 (22rpm = 22*256 = 5632 = 0x1600)	AV	Register	R
17	34	U2	Voltage	1V = 256 (22V = 22*256 = 5632 = 0x1600)	AV	Register	R
18	36	Fault2	Alarm code	1A = 1A (HEX) www.el-piast.com/alarms-decoder	IV	Register	R
19	38	Com2	Communication	1% = 256 (22% = 22*256 = 5632 = 0x1600)	AV	Register	R
20	40	Thr1	Throttle 1	0: Off, 1: On	MSV	Coil 640	R
21	42	Thr2	Throttle 2	0: Off, 1: On	MSV	Coil 672	R

Settings menu

Address DEC		Variable name	HMI Name	States	Type		Read [R] /Write [W]
BacNet	Modbus				BacNet	Modbus	
22	44	v1_t	Starting delay	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
23	46	DelThr	Damp.off delay	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
24	48	PresDel	Pressure delay	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
25	50	G1	Minimum	1% = 256 (22% = 22*256 = 5632 = 0x1600)	AV	Register	R/W
26	52	G2	Maximum	1% = 256 (22% = 22*256 = 5632 = 0x1600)	AV	Register	R/W
27	54	RS1	1.Inv.via RS485	0: Inactive, 1: Active	MSV	Coil 864	R/W
28	56	RS2	2.Inv.via RS485	0: Inactive, 1: Active	MSV	Coil 896	R/W

29	58	Fmin	Freq.min.	1Hz = 256 (22Hz = 22*256 = 5632 = 0x1600)	AV	Register	R/W
30	60	Fmax	Freq.max.	1Hz = 256 (22Hz = 22*256 = 5632 = 0x1600)	AV	Register	R/W
31	62	Adr1	1.inv.address	1 = 256 (22 = 22*256 = 5632 = 0x1600)	AV	Register	R/W
32	64	Adr2	2.inv.address	1 = 256 (22 = 22*256 = 5632 = 0x1600)	AV	Register	R/W
33	66	TaccVent	T.acc.	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
34	68	TdecVent	T.dec.	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W

Service menu

Address DEC		Variable name	HMI Name	States	Type		Read [R] /Write [W]
BacNet	Modbus				BacNet	Modbus	
35	70	ServiceMode	Service mode	0: Inactive, 1: Active	MSV	Coil 1120	R/W
36	72	TYPE	Type	1: N, 2: 2N, 4: N(R), 8: W+DET, 16: 2W+DET, 32: W(R)+DET	MSV	Register	R/W
37	74	PowOnTime	Start time	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
38	76	FanInverters	Fan inverter type	1: IC5,IG5, 2: FC51, 4: FC101, 8: EC Blue, 16: EBM, 32: Eura Drive	MSV	Register	R/W
39	78	ActualAdrECB	Actual address	1 = 256 (22 = 22*256 = 5632 = 0x1600)	AV	Register	R/W
40	80	AdrToSetECB	Address to set	1 = 256 (22 = 22*256 = 5632 = 0x1600)	AV	Register	R/W
41	82	ActiveConfigECB	Set address	0: No, 1: Yes	MSV	Coil 1312	R/W
42	84	StatusConfECB	Status	0: Com Ok, 1: In progress, 2: A_Com, 3: A_Com	MSV	Coil 1344	R
43	86	ActualAdrEBM	Adres aktualny	1 = 256 (22 = 22*256 = 5632 = 0x1600)	AV	Register	R/W
44	88	AdrToSetEBM	Address to set	1 = 256 (22 = 22*256 = 5632 = 0x1600)	AV	Register	R/W
45	90	ActiveConfigEBM	Set address	0: No, 1: Yes	MSV	Coil 1440	R/W
46	92	StatusConfEBM	Status	0: Ok, 1: In progress, 2: A_Com, 3: A_Com	MSV	Coil 1472	R
47	94	Vent1_0_10	Vent.1	0: Inactive, 1: Aout1, 2: Aout2, 4: Aout3	MSV	Register	R/W
48	96	Vent2_0_10	Vent.2	0: Inactive, 1: Aout1, 2: Aout2, 4: Aout3	MSV	Register	R/W
49	98	Re_Work	Work - contact	0: Inactive, 1: Re1, 2: Re2, 4: Re3, 8: Re4, 16: Re5	MSV	Register	R/W
50	100	Re_Alarm	Alarm - contact	0: Inactive, 1: Re1, 2: Re2, 4: Re3, 8: Re4, 16: Re5	MSV	Register	R/W
51	102	Tcom	Tcom	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
52	104	Twait	Twait	1s = 256 (22s = 22*256 = 5632 = 0x1600)	AV	Register	R/W
53	106	_DIN1	Din1	0: Opened, 1: Closed	MSV	Coil 1696	R
54	108	_DIN2	Din2	0: Opened, 1: Closed	MSV	Coil 1728	R
55	110	_DIN3	Din3	0: Opened, 1: Closed	MSV	Coil 1760	R
56	112	_DIPT_1	PT1	0: Opened, 1: Closed	AV	Register	R
57	114	_DIPT_2	PT2	0: Opened, 1: Closed	AV	Register	R
58	116	Re1	Re1	0: Off, 1: On	MSV	Coil 1856	R
59	118	Re2	Re2	0: Off, 1: On	MSV	Coil 1888	R
60	120	Re3	Re3	0: Off, 1: On	MSV	Coil 1920	R
61	122	Re4	Re4	0: Off, 1: On	MSV	Coil 1952	R
62	124	Re5	Re5	0: Off, 1: On	MSV	Coil 1984	R

63	126	AO1	Aout1	1V = 256 (10V = 10*256 = 2560 = 0xA00)	AV	Register	R
64	128	AO2	Aout2	1V = 256 (10V = 10*256 = 2560 = 0xA00)	AV	Register	R
65	130	AO3	Aout3	1V = 256 (10V = 10*256 = 2560 = 0xA00)	AV	Register	R
66	132	F_DIN1	Din1	0: No emulation, 1: Set opened, 3: Set closed	MSV	Register	R/W
67	134	F_DIN2	Din2	0: No emulation, 1: Set opened, 3: Set closed	MSV	Register	R/W
68	136	F_DIN3	Din3	0: No emulation, 1: Set opened, 3: Set closed	MSV	Register	R/W
69	138	F_DIPT1	PT1	0: No emulation, 1: Set opened, 3: Set closed	MSV	Coil 2208	R/W
70	140	F_DIPT2	PT2	0: No emulation, 1: Set opened, 3: Set closed	MSV	Coil 2240	R/W
71	142	F_Re1	Re1	0: No force, 1: Force off, 3: Force on	MSV	Register	R/W
72	144	F_Re2	Re2	0: No force, 1: Force off, 3: Force on	MSV	Register	R/W
73	146	F_Re3	Re3	0: No force, 1: Force off, 3: Force on	MSV	Register	R/W
74	148	F_Re4	Re4	0: No force, 1: Force off, 3: Force on	MSV	Register	R/W
75	150	F_Re5	Re5	0: No force, 1: Force off, 3: Force on	MSV	Register	R/W
76	152	FoAO1	Aout1 Forcing	0: Disabled, 1: Enabled	MSV	Coil 2432	R/W
77	154	F_AO1	Aout1	1V = 256 (10V = 10*256 = 2560 = 0xA00)	AV	Register	R/W
78	156	FoAO2	Aout2 Forcing	0: Disabled, 1: Enabled	MSV	Coil 2496	R/W
79	158	F_AO2	Aout2	1V = 256 (10V = 10*256 = 2560 = 0xA00)	AV	Register	R/W
80	160	FoAO3	Aout3 Forcing	0: Disabled, 1: Enabled	MSV	Coil 2560	R/W
81	162	F_AO3	Aout3	1V = 256 (10V = 10*256 = 2560 = 0xA00)	AV	Register	R/W

Alarms

Addres DEC		Variable name	HMI Name	States	Type		Read [R] /Write [W]
BacNet	Modbus				BacNet	Modbus	
82	164	ResetAlarms	ResetAlarms	0 - no reset, 1 - reset	MSV	Coil 2624	R/W
83	166	A_StopSystem	Fire alarm	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2656	R
84	168	A_OpenVent	Alarm of the opened ventilator zone	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2688	R
85	170	A_Filter	Alarm of the dirty filter	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2720	R
86	172	A_FC1	Alarm of the inverter 1	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2752	R
87	174	A_FC2	Alarm of the inverter 2	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2784	R
88	176	A_ComFC1	Alarm lock of communication with the inverter 1	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2816	R
89	178	A_ComFC2	Alarm lock of communication with the inverter 2	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2848	R
90	180	A_InEmul	Alarm of the emulation of entries of the controller	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2880	R
91	182	A_OutForce	Alarm of pushing exits of the controller	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2912	R
92	184	Alarm	Collective alarm	0 - an alarm is missing, 1 - an alarm is appearing	BV	Coil 2944	R

Variables for the reading and the edition

Address	Variable	Description	State
0x 02	Mode	Mode	0 - stop, 1 - stop auto, 2 - work I step, 4 - work II step, 8 - calendar
0x 04	ResAl	Erasing blocking alerts	0 - lack of erasing, 1 - erasing

Variables read-only

Address	Variable	Description	State
0x 06	Detector	Detector state	0 - no alarm, 1 - Alarm 1, 2 - Alarm 2, 3 - Alarm 2
0x 08	Thr1	As controlled of dumper 1	0 - stop, 1 - start
0x 0A	Thr2	As controlled of dumper 2	0 - stop, 1 - start
0x 0C	Vent1	Start/stop the signal of fan 1	0 - stop, 1 - start
0x 0E	Vent2	Start/stop the signal of fan 2	0 - stop, 1 - start
0x 10	ServiceMode	Service mode	0 - stop, 1 - start
0x 12	Work	Confirming of the work the system	0 - stop, 1 - start
0x 14	Pwr1	As controlled supply inverter 1	1% = 256 (22% = 22*256 = 5632 = 0x1600)
0x 16	Pwr2	As controlled supply inverter 2	1% = 256 (22% = 22*256 = 5632 = 0x1600)
0x 18	F1	Frequency inverter supply 1	1Hz = 256 (22Hz = 22*256 = 5632 = 0x1600)
0x 1A	F2	Frequency inverter supply 2	1Hz = 256 (22Hz = 22*256 = 5632 = 0x1600)
0x 1C	U1	Engine voltage supply fan 1	1V = 256 (22V = 22*256 = 5632 = 0x1600)
0x 1E	U2	Engine voltage supply fan 2	1V = 256 (22V = 22*256 = 5632 = 0x1600)
0x 20	I1	Engine current supply fan 1	1A = 256 (22A = 22*256 = 5632 = 0x1600)
0x 22	I2	Engine current supply fan 2	1A = 256 (22A = 22*256 = 5632 = 0x1600)
0x 24	A_StopSystem	Fire alarm	0 - an alarm is missing, 1 - an alarm is appearing
0x 26	A_OpenVent	Alarm of the opened ventilator zone	0 - an alarm is missing, 1 - an alarm is appearing
0x 28	A_Filter	Alarm of the dirty filter	0 - an alarm is missing, 1 - an alarm is appearing
0x 2A	A_FC1	Alarm of the inverter 1	0 - an alarm is missing, 1 - an alarm is appearing
0x 2C	A_FC2	Alarm of the inverter 2	0 - an alarm is missing, 1 - an alarm is appearing
0x 2E	A_ComFC1	Alarm lock of communication with the inverter 1	0 - an alarm is missing, 1 - an alarm is appearing
0x 30	A_ComFC2	Alarm lock of communication with the inverter 2	0 - an alarm is missing, 1 - an alarm is appearing
0x 32	A_InEmul	Alarm of the emulation of entries of the controler	0 - an alarm is missing, 1 - an alarm is appearing
0x 34	A_OutForce	Alarm of pushing exits of the controler	0 - an alarm is missing, 1 - an alarm is appearing
0x 36	Alarm	Collective alarm	0 - an alarm is missing, 1 - an alarm is appearing

9. Communication Bacnet MS-TP with BMS system

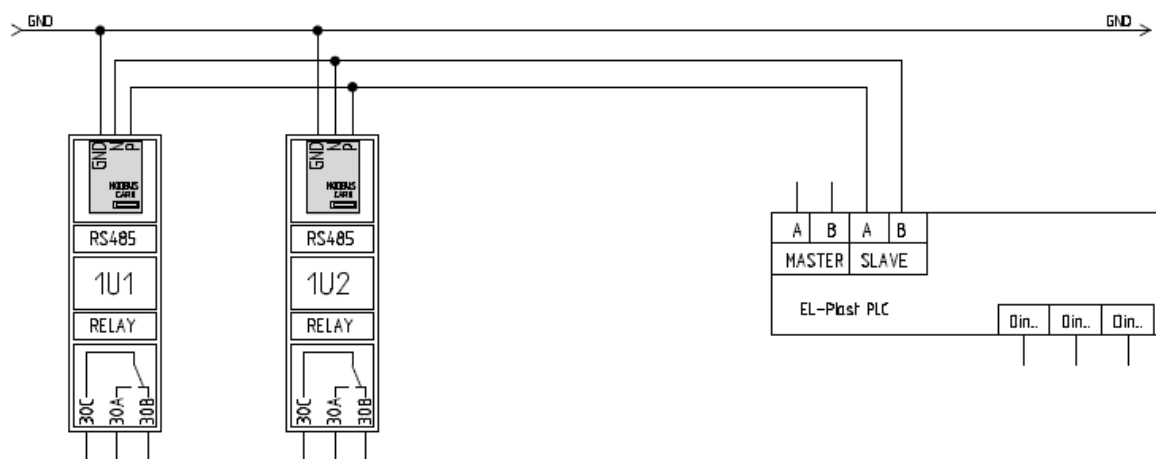
Variables BacNet should look after connecting the powered controller and the introduction of appropriate BacNet network settings (see item5)

10. Communication RS485 Slave, Modbus RTU with inverters LG IC5

<http://www.aniro.pl/do-pobrania/do-pobrania/finish/31-instrukcja-eng/16-ig5a-manual-v2-4-110131-1/0.html>



Example for system with 2W, WR



Configuration drive LG IC5 control RS485:

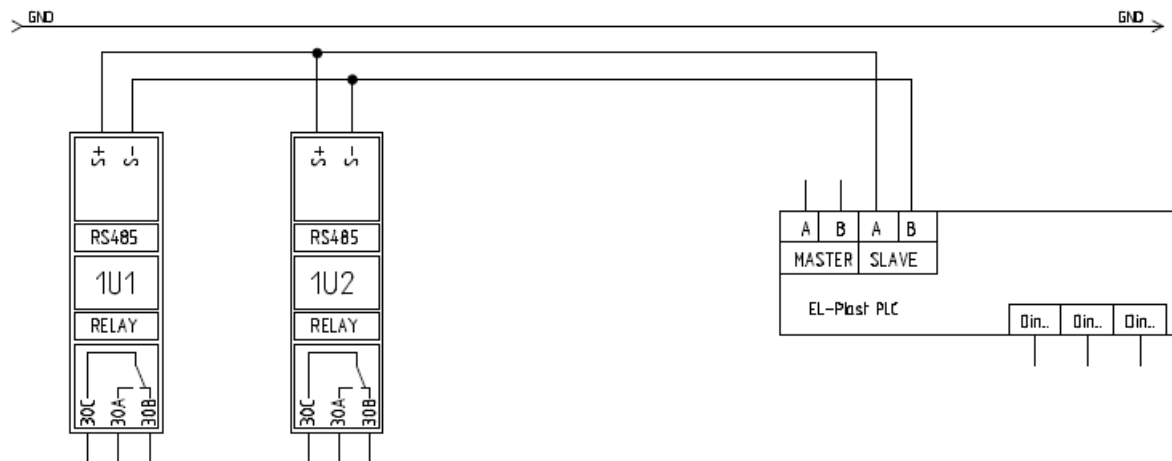
Code	Name	Value to be set	Description
drv	Control mode	3	Communication RS485
Frq	The method of frequency	8	Communication Modbus-RTU
F21	Maximum output frequency	Fz max	Set individual
F22	Rated motor frequency	...Hz	Set individual
F23	The minimum frequency reference	0.000	Always enter the value
F30	Characteristic U/F	0	Linear
F50	Motor overload protection	1	active
H30	Rated motor power	...kW	With the motor nameplate
H33	Rated motor current	...A	With the motor nameplate
I55	Relay function	12	Work without alarm
I60	Drive address	1	Inverter supply fan
		2	Inverter exhaust fan
		3	Inverter 2 supply fan
		4	Inverter 2 exhaust fan
I61	transmission speed	3	9600
I62	Reaction to loss of communication	2	stop
I63	Communication time	10.0	

Fz max - frequency inverter for work at maximum fan efficiency (resulting from the adjustment of air distribution system). Initially, enter the frequency from the Air Handling Unit documentation.

NOTE: The settings in the controller (Settings/Fan/RS485/Maximum frequency) must be at least 0.1Hz lower than Fzmax, otherwise the inverter may show control errors.

11. Communication RS485 Slave, Modbus RTU with inverters LG IG5

Example for system with 2W, WR



Configuration drive LG IG5 control RS485:

Code	Name	Value to be set	Description
drv	Control mode	3	Communication RS485
Frg	The method of frequency	7	Communication Modbus-RTU
F21	Maximum output frequency	Fz max	Set individual
F22	Rated motor frequency	...Hz	Set individual
F23	The minimum frequency reference	0.000	Always enter the value
F30	Characteristic U/F	0	Linear
F50	Motor overload protection	1	active
H30	Rated motor power	...kW	With the motor nameplate
H33	Rated motor current	...A	With the motor nameplate
I55	Relay function	12	Work without alarm
I60	Drive address	1	Inverter supply fan
		2	Inverter exhaust fan
		3	Inverter 2 supply fan
		4	Inverter 2 exhaust fan
I61	transmission speed	3	9600
I62	Reaction to loss of communication	2	Stop
I63	Communication time	10.0	

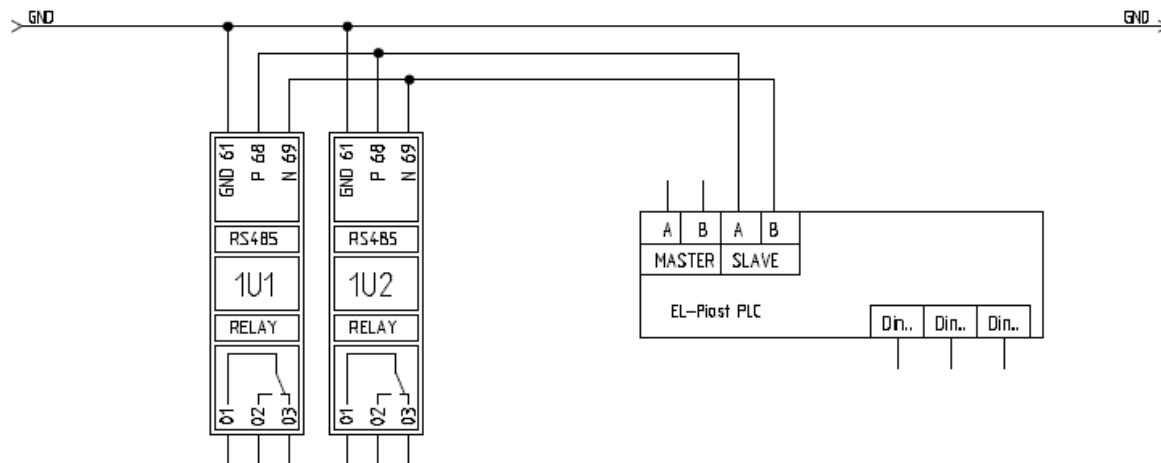
Fz max - frequency inverter for work at maximum fan efficiency (resulting from the adjustment of air distribution system). Initially, enter the frequency from the Air Handling Unit documentation.

NOTE: The settings in the controller (Settings/Fan/RS485/Maximum frequency) must be at least 0.1Hz lower than Fzmax, otherwise the inverter may show control errors.

12. Communication RS485 Slave, Modbus RTU with inverters Danfoss FC51

<http://www.danfoss.com/poland/businessareas/drivessolutions/frequency+converters/vlt+micro+drive.htm>

Example for system with 2W, WR



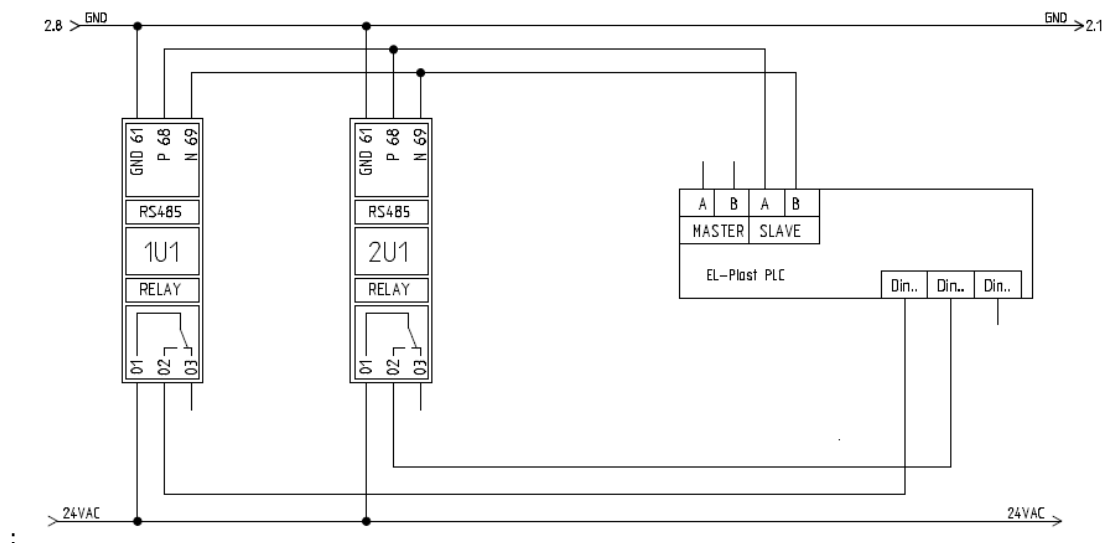
Configuration drive Danfoss FC51 control RS485

Code	Name	Value to be set	Description
1-03	Characteristic U/F	0	Linear
1-20	Rated motor power	...kW	With the motor nameplate
1-24	Rated motor current	...A	With the motor nameplate
1-25	Rated motor speed	...rpm	With the motor nameplate
1-90	Motor overload protection	4	Emergency off ETR
3-02	The minimum frequency reference	0.000	Always enter the value
3-03	The maximum frequency reference	Fz max	Set individual
3-17	Control input	11	Modbus
4-14	Maximum output frequency	Fz max	Set individual
4-16	Output current limitation	150,0	-
5-40	Relay function	6	Work without alarm
8-01	Control	0	Digital and communication
8-02	Control	1	FC RS485
8-03	Wait to communication	10.0s	-
8-04	Lost communication reaction	2	Stop
8-30	Choose communication protocol	2	Modbus RTU
8-31	Drive address	1	Inverter supply fan
		2	Inverter exhaust fan
		3	Inverter 2 supply fan
		4	Inverter 2 exhaust fan
8-32	Transmission speed	2	9600
8-33	Parity FV port	3	No parity, 2 stop bits

Fz max - frequency inverter for work at maximum fan efficiency (resulting from the adjustment of air distribution system). Initially, enter the frequency from the Air Handling Unit documentation.

13. Communication RS485 Slave, Modbus RTU with inverters Danfoss FC101

<http://drives.danfoss.us/products/vlt/low-voltage-drives/vlt-hvac-basic-drive-fc-101/#/>



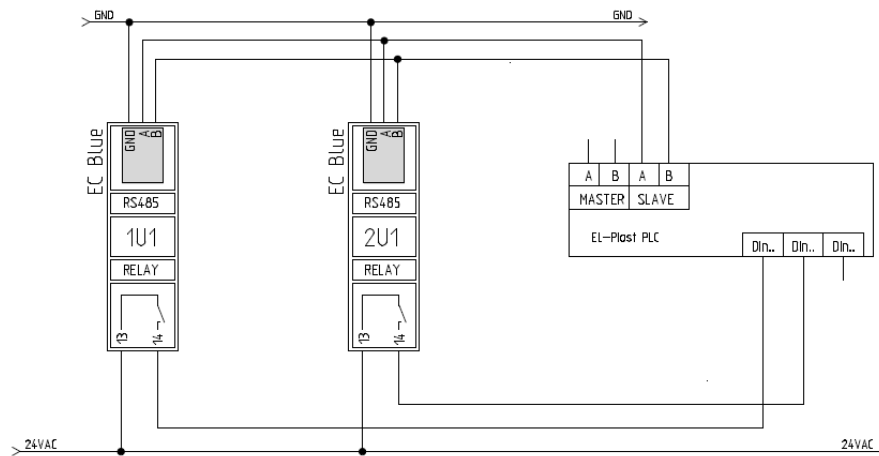
In addition, the DANFOS FC101 inputs must be shorted with numbers 12 and 27

Configuration drive Danfoss FC101 control RS485

Code	Name	Value to be set	Description
1-03	Characteristic U/F	3	-
1-20	Rated motor power	...kW	According to motor nameplate
1-24	Rated motor current	...A	According to motor nameplate
1-25	Rated motor speed	...rpm	According to motor nameplate
1-90	Motor overload thermal protection	4	Emergency off ETR
3-02	The minimum frequency reference	0.000	Always enter the value
3-03	The maximum frequency reference	Fz max	Set individual
3-17	Control input	11	Modbus
4-14	Maximum output frequency	Fz max	Set individual
4-18	Output current limitation	150,0	-
5-40	Relay function	06	Work without alarm
8-01	Control	0	Digital and communication
8-02	Control	1	FC PORT
8-03	Wait to communication	10.0s	-
8-04	Lost communication reaction	2	Stop
8-30	Choose communication protocol	2	Modbus RTU
8-31	Drive address	1	Inverter supply fan
		2	Inverter exhaust fan
		3	Inverter 2 supply fan
		4	Inverter 2 exhaust fan
8-32	Transmission speed	2	9600
8-33	Parity FV port	3	No parity, 2 stop bits

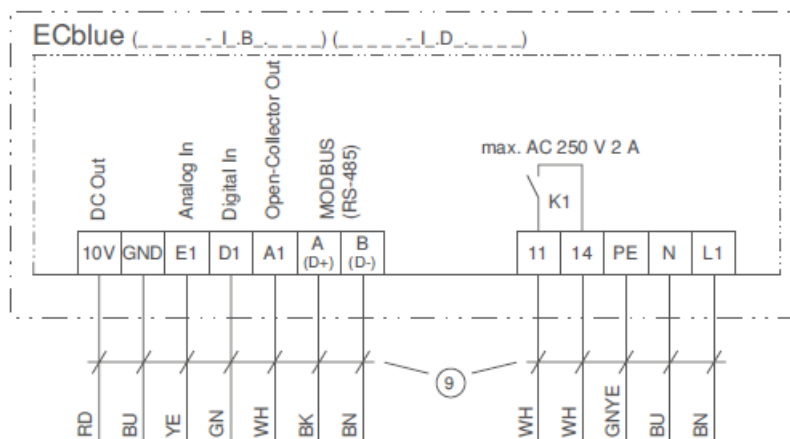
Fz max - frequency inverter for work at maximum fan efficiency (resulting from the adjustment of air distribution system). Initially, enter the frequency from the Air Handling Unit documentation.

14. Communication RS485 Slave, Modbus RTU with EC Blue motors



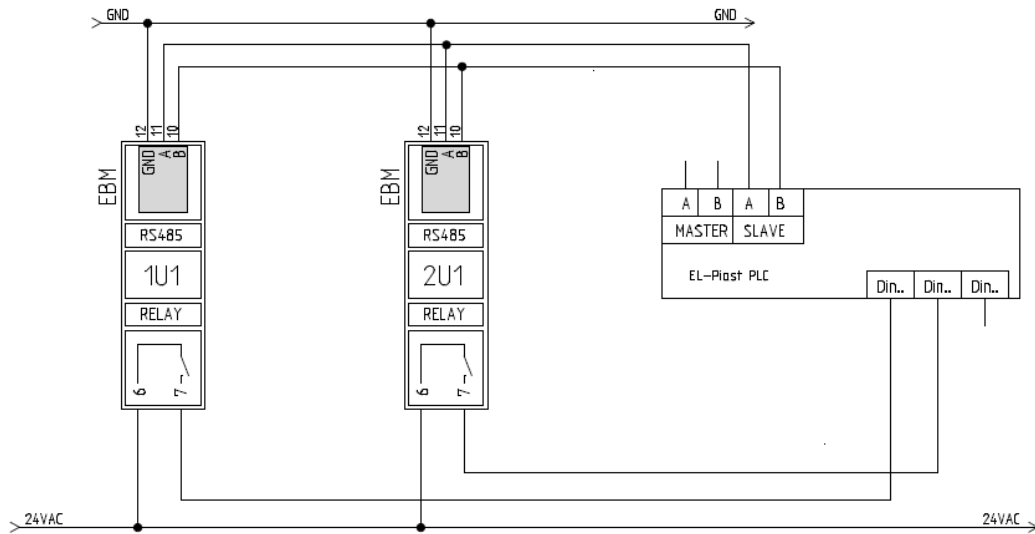
Wiring connection of EC Blue fan

Connection	Color of cable	Cable function
PE	yellow/green	Ground
N	blue	Power supply – „0“
L	brown	Power supply – phase
11	white 1	Motor status relay – closed -> work confirmation
12	white 2	
B	brown	RS-485 MODBUS
A	black	
GND	blue	„0“ for control signal



EC Blue Fan Controller Configuration - Service Menu/Fans/EC Blue Address

15. Communication RS485 Slave, Modbus RTU with inverters EBM motors



Wiring connection of EC Blue fan

Cable nr.	Connection	Color of cable	Cable function
1,2	PE	yellow/green	Ground
3	N	blue	Power supply – „0”
5	L	black	Power supply – phase
6	NC	white 1	Motor status relay – closed -> work confirmation
7	COM	white 2	
10	RSB	brown	RS485 MODBUS
11	RSA	white	RS 485 MODBUS
12	GND	blue	„0” for control signal

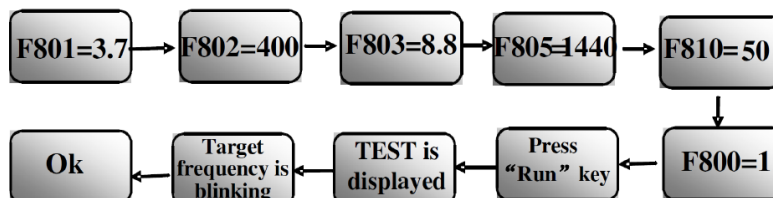
EBM Fan Controller Configuration - Service Menu/Fans/EBM Address

16. Communication RS485 Slave, Modbus RTU with inverters Eura E800,E1000, E2000

Configuration drive EURA E800, E1000, E2000 control RS485

Code	Name	Value to be set	Description
F106	Control mode	2	Scalar U/F
F111	The maximum output frequency	Fz max	Individual setting
F118	Nominal frequency of the motor	...Hz	From the motor rating plate (50Hz / 60Hz)
F200	The source of the start command	4	Keyboard + terminal + Modbus RS485
F201	The source of the stop command	4	Keyboard + terminal + Modbus RS485
F203	The main source of frequency	10	Modbus RS485
F300	Relay function	5	Operation without alarm
F607	Current protection	1	Enabled
F608	Limit current%	130	Limit current
F613	Flying start	1	Enabled
F801	Rated engine power	...kW	From the motor rating plate
F802	Rated motor voltage	... V	From the motor rating plate
F803	Rated motor current	...A	From the motor rating plate
F805	The rated speed of the engine	... obr/min	From the motor rating plate
F810	Nominal frequency of the motor	...Hz	From the motor rating plate (50Hz/60Hz)
F800	Motor autotuning	1	Before autotuning, it is necessary to enter the above parameters

Example of engine parameterization 3,7kW, 400V, 1440 obr/min, 8,8A, 50Hz



After entering the motor parameters from the nameplate, press the green RUN button, the word TEST will appear. After the measurement, which should last up to about 1 minute, the drive is ready for operation.

F900	Drive address	1	Inverter fan 1
		2	Inverter fan 2
F901	Transmission type	2	RTU
F904	Transmission speed	3	9600
F905	Time to wait for communication	10.0	Response to the disappearance of communication - stop

Fz max - frequency inverter for work at maximum fan efficiency (resulting from the adjustment of air distribution system). Initially, enter the frequency from the Air Handling Unit documentation.

NOTE: The settings in the controller (Settings/Fan/RS485/Maximum frequency) must be at least 0.1Hz lower than Fzmax, otherwise the inverter may show control errors.