

eluft

AIR SUPPLY SYSTEM FOR ETFE CONSTRUCTION

CONNECTIVITY



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1. Standard features eluft machines

1.1. 5 dry contacts in each eluft – to the building management system

There is a collective error message system to the house control system.

The eluft machine has 5 potential-free contacts, which may be connected to the BMS system so they can send out error messages. The contacts can be connected using bell wire.

The errors that can be shown are:

- Common fault
- Control OK
- Min pressure
- Max pressure
- Power failure (or switched ON/OFF)

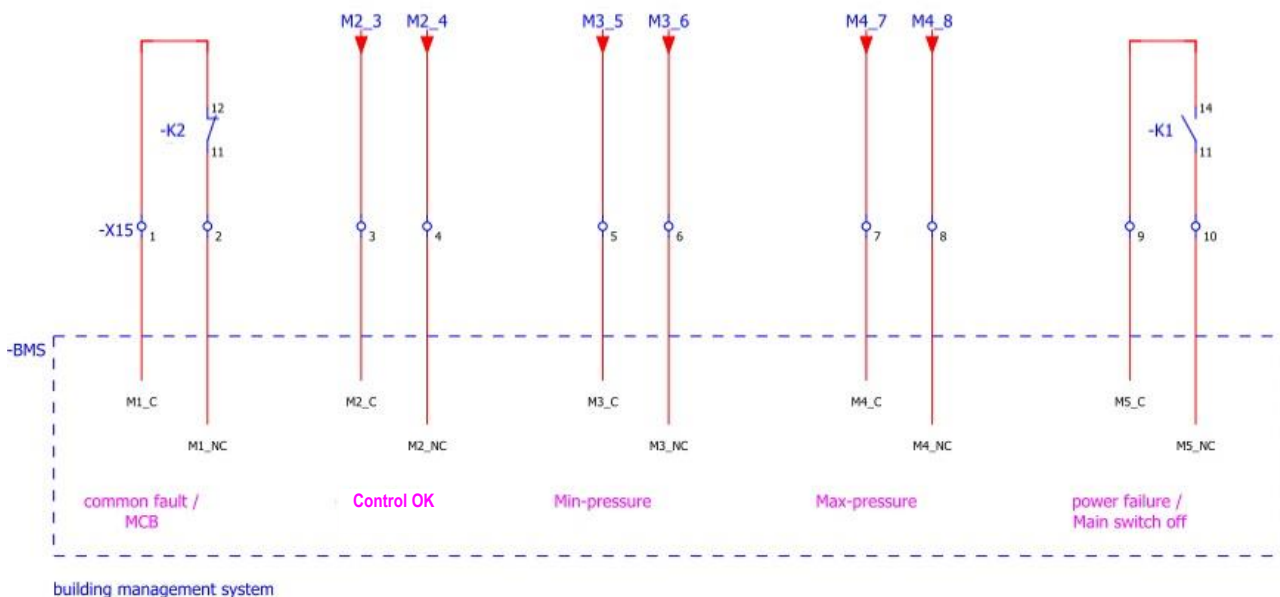
The (common fault) error message may be sent in case of total failure, i.e. loss of function, or partial failure. A partial failure would be e.g. in case a fan or dehumidifier breaks down, but the air blower system can still maintain the required pressure.

In addition, an error message is sent in case the pressure falls below the preset PMin or in case the pressure exceeds the preset PMax (= pressure fault).

In case the machine no longer has power, a message is also sent to the BMS.

A master control unit has four potential-free contacts for each connected eluft.

Extract from the electrical wiring diagram:



potential free dry contacts for external messages

normal operation = all contacts closed

1.2. LAN-capable display for Webserver



The Logic controller may be connected to a Laptop/PC/tablet or similar using a LAN cable or wireless antenna (WAP-option).

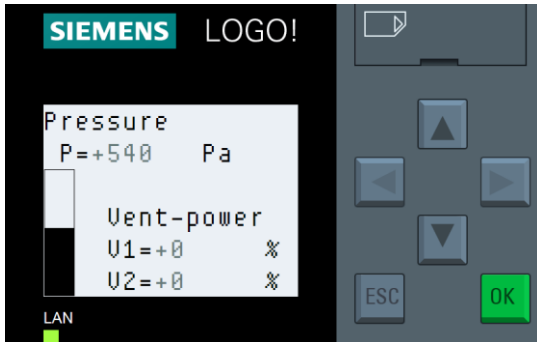
LAN connection for Webserver

To access the webserver, the user has to enter the correct IP address (**192.168.7.6x**) into the top line of the browser. **PLEASE NOTE:** The last x is a digit which can be found on the logic programmer, it differs for every eluft unit (e.g. some projects have more than one eluft machine on site, eluft station #1 IP address = 192.168.7.61, next eluft is 192.168.7.62, etc.).

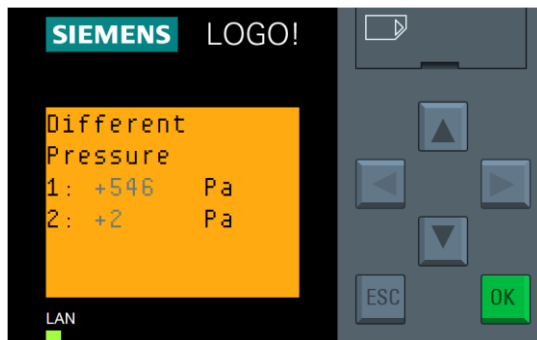


- Username given will be **Web User** and password is **eluft!**
- Press **Log on** to start.

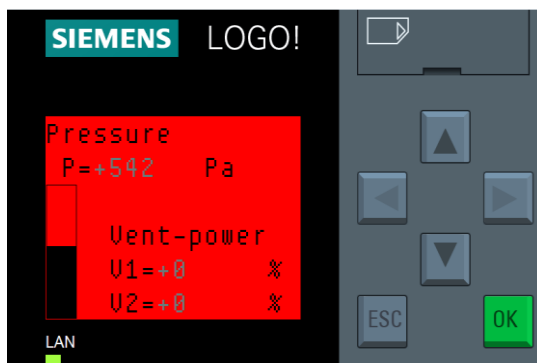
The displays shown on the screen as well as the functions are the same as on the display inside the air machine (Logic controller).



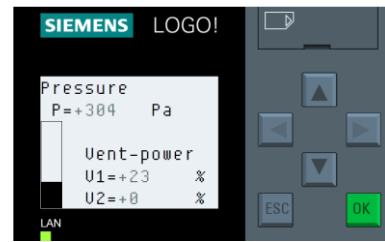
In case of warning, the background of the display turns orange.



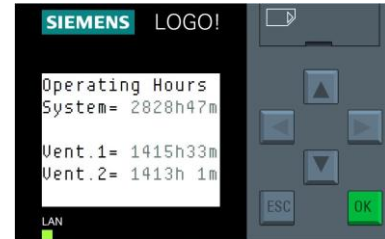
In case of error(s) the operating / alarm contact is switched over, the warning light on the casing lights up red and the background of the display also becomes red. To view the error, just use the cursor "up" until you reach the error message.



This first screen shows the current pressure in the cushions and the percentage of both fans.
 The preset pressure is usually 300 Pa.
 As the fans alternate, only V1 or V2 should show a percentage. (in this picture V1 runs at 23% of its capacity).



This screen shows the operating hours of the system and of each separate fan.
 As a rule of thumb both fans should have run about the same amount of hours and the total of Vent 1 and Vent 2 should be approx. the same as the total hours of the system.



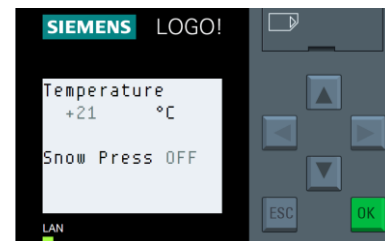
This screen shows the measured wind speed in meter per second and if the increased wind pressure is currently ON or OFF – only when connected.
 The wind time is the remaining time until the increased pressure changes back to normal pressure.
 If no wind sensor is connected, it shows +0.0m/s.



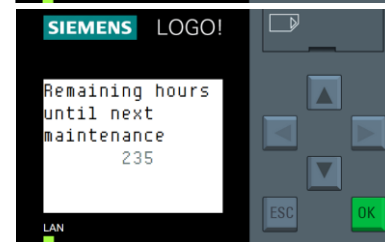
This screen shows the snow height measured by the snow height sensor – only when connected.



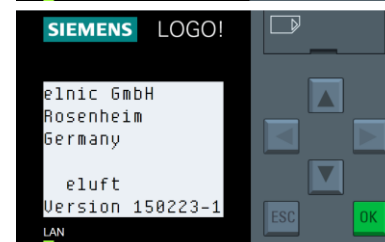
This screens shows the readings of the snow detection sensor (outside temperature) – only when connected.
 And whether the increased pressure is currently **ON** (only if temperature falls below certain degrees and surface of detection sensor is humid) or **OFF**.



This screen shows the remaining hours before the next maintenance has to be carried out.
 The standard preset total amount of hours is 8,500.



This screen shows the software version.



Only **trained service staff** is allowed to change parameters, for which a service code (password) is needed. Please contact elnic for further help.

2. Optional features eluft machines

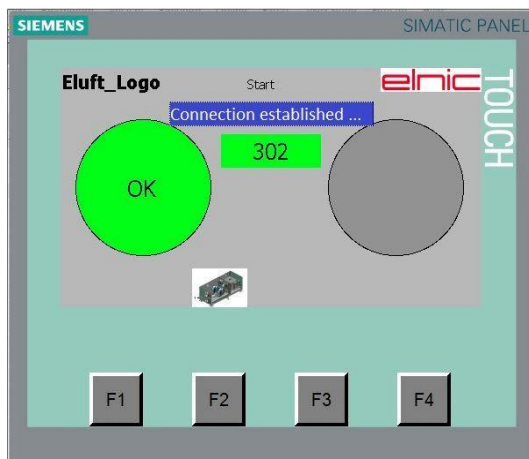
2.1. External control unit



May be connected to upto 2 air machines using a LAN cable.

2.1.1. Starting screen

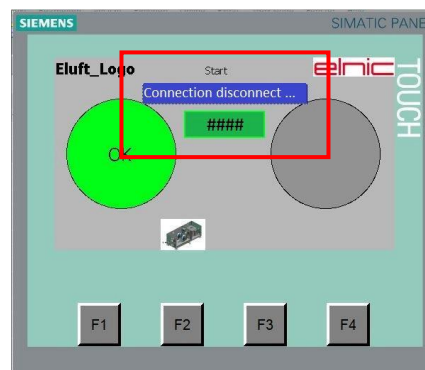
Shows data on the eluft unit and offers access to the diagnose pages. In the screen below, all values are OK as the circle, which stands for the eluft machine (operating mode), the middle rectangle (pressure) is green.



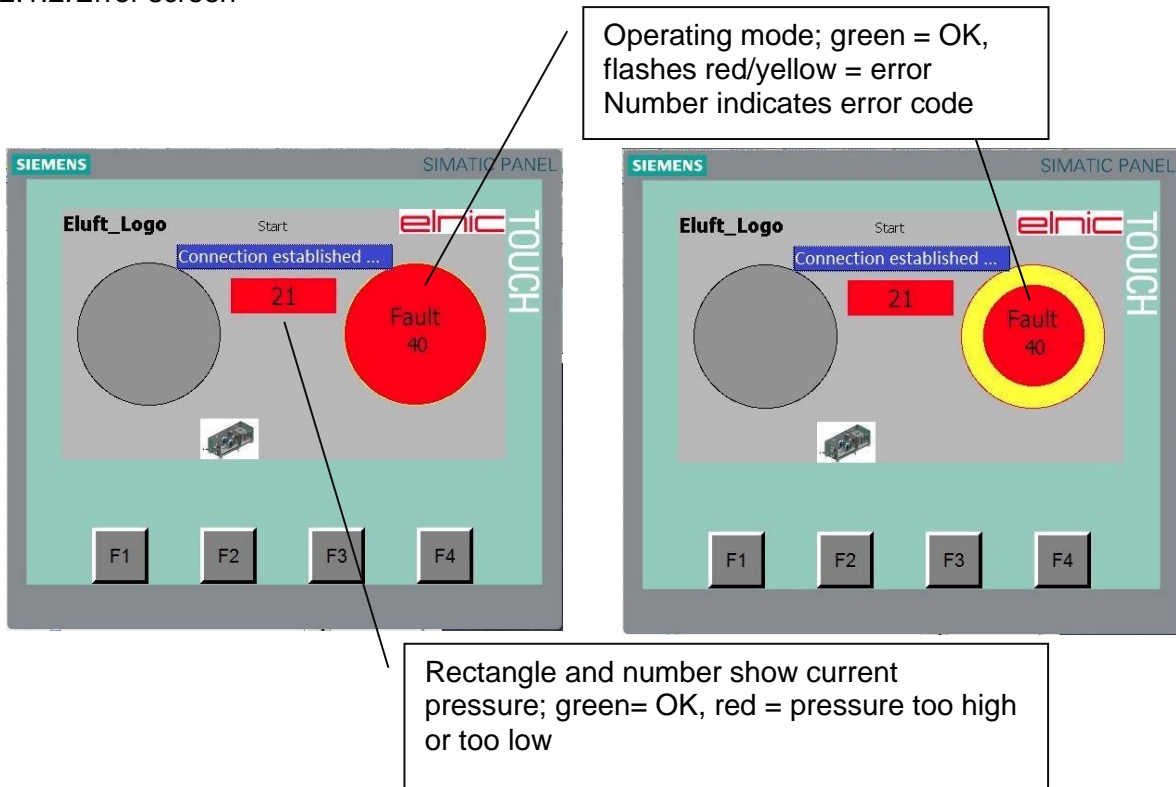
To enter other screens:

F2 =eluft → to call up data on connected eluft unit.

In case there is no connection, it is displayed on the screen as follows (red rectangle):



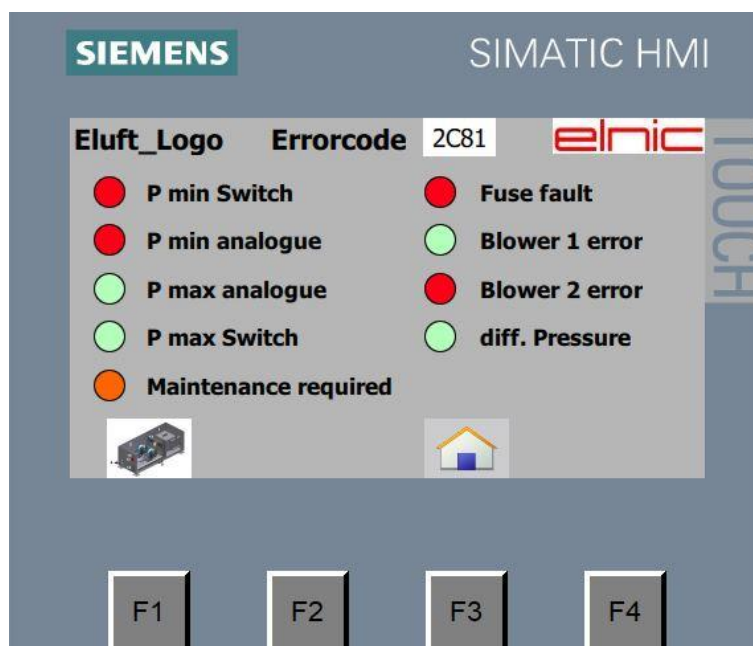
2.1.2. Error screen



List of possible error CODE messages:

The screens show all possible errors. The error code ## stands for “no connection to eluft”. If one or more dots are red, this means this/these error(s) currently exist(s). The error code shown in the white square may be helpful for service personnel.

Please contact the manufacturer in order to make a better diagnosis.



2.1.3. Data screen

This screen is for information purposes only. Data cannot be changed.

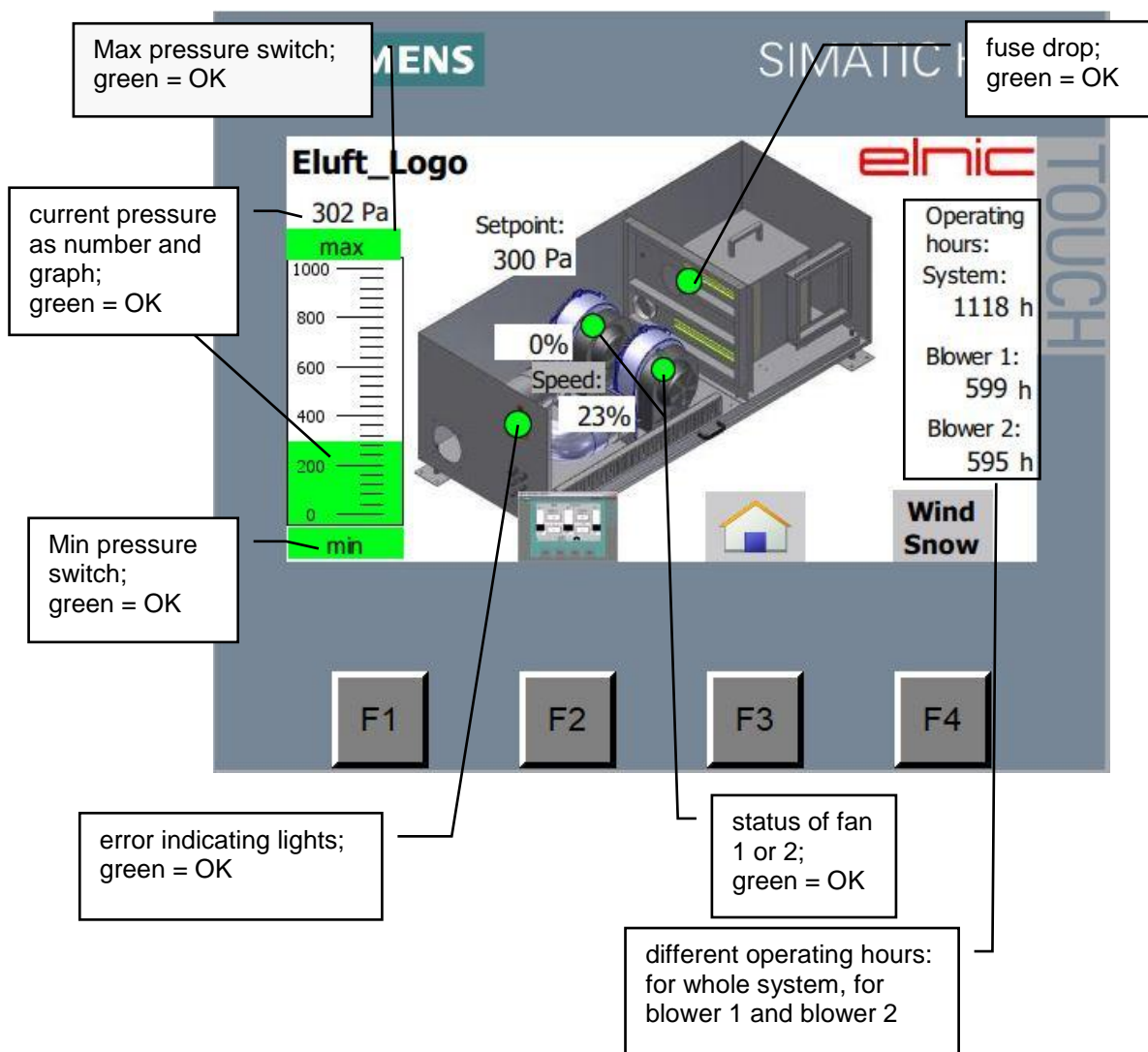
Refer starting screen: to call up data on the eluft tap F2. The screen below shows all values are OK.

F2 =Parameters the “password entry” screen appears for trained operators or service personnel only, for user no further operating possibilities are available. Please proceed as described under 6.4. Then the “parameter pressure setpoint” screen appears.

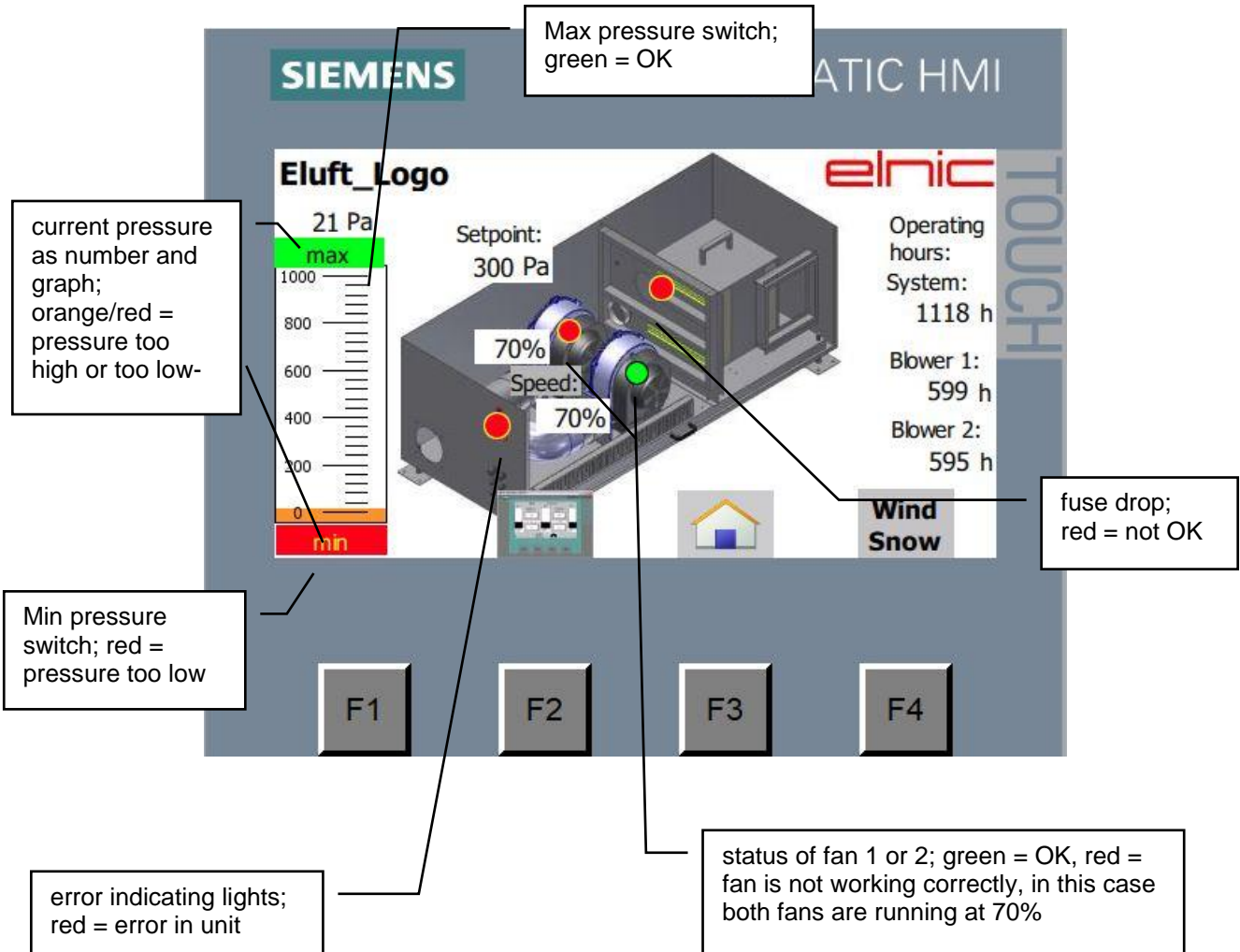
F3 =Home the starting screen appears

F4 = ? this link is for trained personnel only.

General information on this display: setpoint : pressure, which needs to be maintained (preset in system). Speed of fan 1 and 2 in percentage. Operating hours for system, blower 1 and 2.

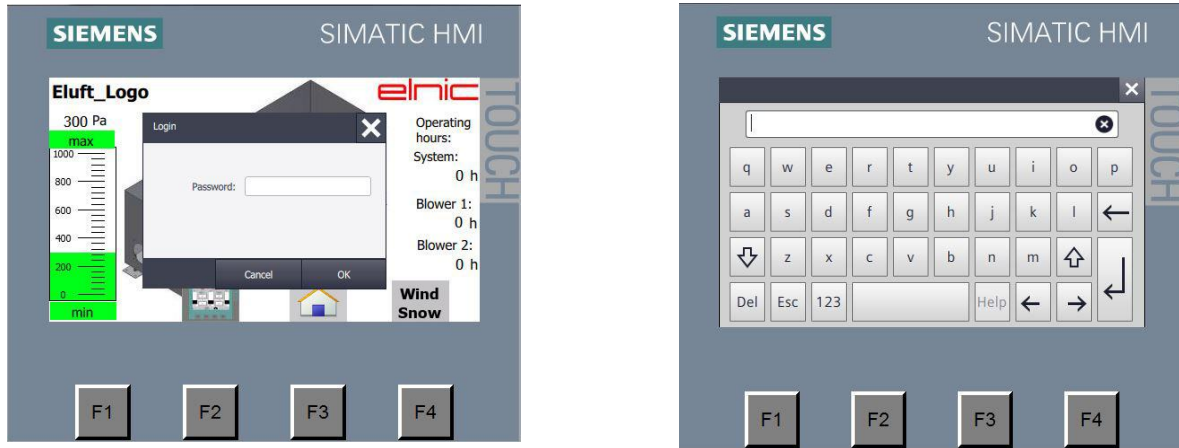


The picture below shows all possible error messages on the overview screen.



2.1.4. Password screen

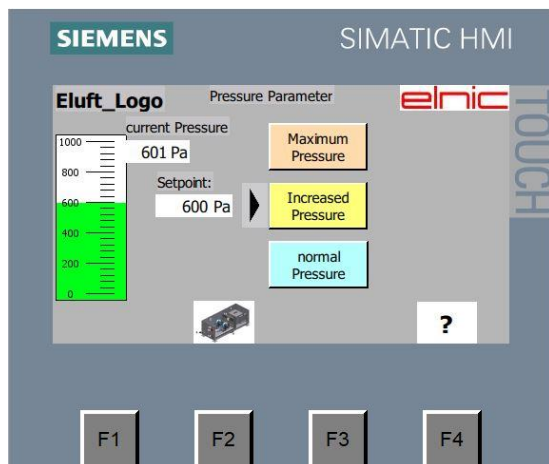
Enter the password by tapping the correct letters or digits on the screen. The entered password shows as stars. Then tap **↵** to confirm. Confirm again by tapping OK. The screen disappears, the next screen pressure parameter appears.



The password entry is valid for about 5 minutes. A message “user logged off” appears when the session is over. To make further changes, please enter password again.

2.1.5. Parameter pressure setpoint eluft

These parameters allow to set the normal pressure for the cushions and max pressure. Setting is only allowed by trained service personnel and blocked for the user.



F2 =parameters shows the “current values” for eluft screen.

F4 =? This link is for trained personnel only.

To change the values, click into one of the three boxes:

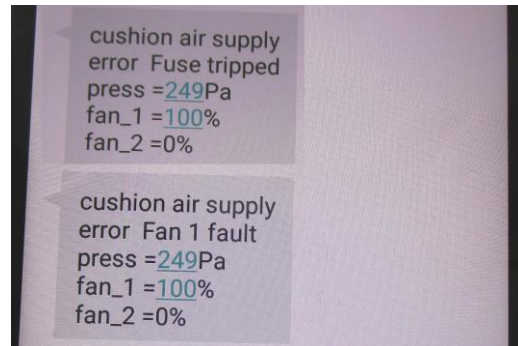
- Maximum pressure
- Increased pressure
- Normal pressure.

The arrow in front of one of the boxes shows the current setting. Please note that the setpoint cannot be changed, these are data preset in the eluft machine.

2.2. SMS relay to receive error messages

An optional integrated SMS or email module can send an alert message to several designated phones and/or email addresses at any time to inform operators and maintenance personnel about the system status or to provide alert messages.

The SMS relay is also available with battery pack so error messages can still be sent in case of power failure. (SMS-A interface).



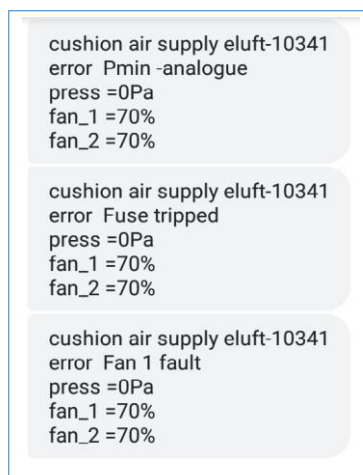
2.3. SMS relay-plus to additionally request status

The last thing an end user wants to do is to check his ETFE structure by e.g. regularly viewing the status of the eluft air machine, being the heart of the whole system.

The solution is a remote, preventative maintenance done by the system provider or maintenance company.

In order to do so, data about the system is required on a regular basis. As the system locations may be far away or difficult-to-reach, e.g. on the roof top, elnic offers the possibility for remote access via the internet. Unfortunately, only a very limited number of end customers are able or willing to connect the eluft machines to their network or provide a router.

The only other eluft device, which is able to send data to specified receivers is the SMS relay, however, up to now no reporting function was available. As the SMS technology needs no specific infrastructure, just a simple SIM card, elnic concentrated on expanding the SMS alert interface.



Meanwhile elnic has developed and tested add-on software that allows the eluft controller to send all relevant data on demand.

- ➔ Just send an SMS requesting a certain set of data to the phone number of the eluft and in return you will receive the current system data.

The SMS interface + always has a battery pack so it also functions in case of power failure.

2.4. Master control unit + data collectors

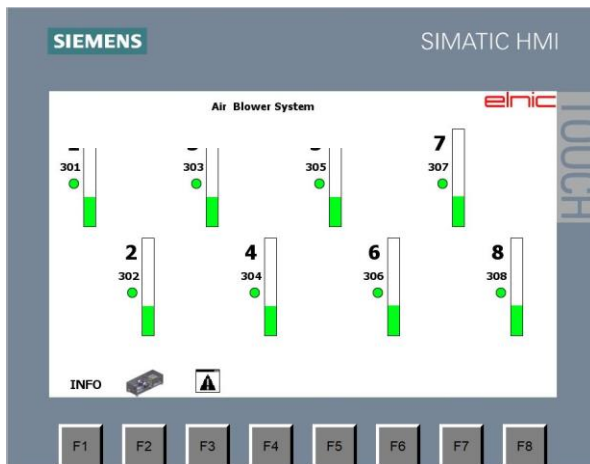


Additional data collector

It is possible to connect up to 7 air machines to the MCU using a LAN cable. In case the project requires more than 7 air machines, you can add data collectors. Each data collector can be connected to up to 5 machines.

2.4.1. Starting screen

Shows an overview of all eluft units and offers access to the diagnose pages. In the screen below, all values are OK as all indicator lights (operating mode), all graphs (pressure) are green.



To enter other screens:

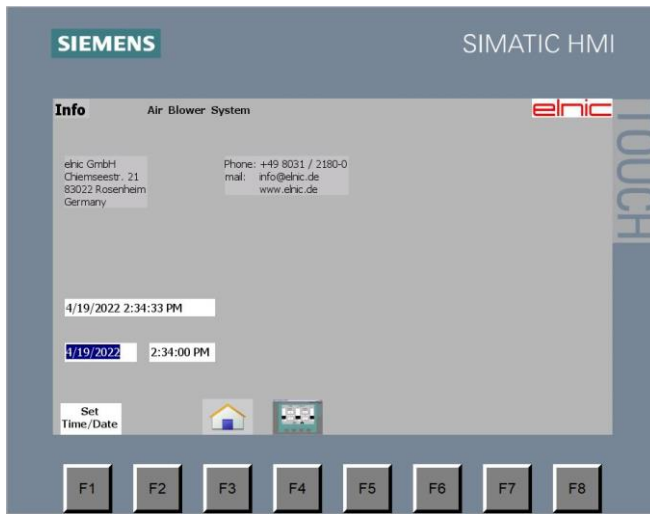
F1 = Info the screen showing „project name“ and „producer data“ appears (Data display).

F2 = eluft → to call up data on connected eluft units. (data of different eluft units).

F3 = Warning the screen with a list of errors appears.

2.4.2. Data display

This screen shows company data of the manufacturer of the eluft air supply unit.



With **F1 = Set Time/Date** the date and time can be changed. Top date and time are current data. Bottom line with date and time are to change current data. Click into bottom line boxes to change.

A different screen with "touch input panel" with keyboard appears, the format is specified. Confirm with enter ↵. The Info screen reappears. To save, click **F1**.

F3 = Home the MCU returns to the starting screen.

F4 = → for maintenance purposes only, no access for customer.

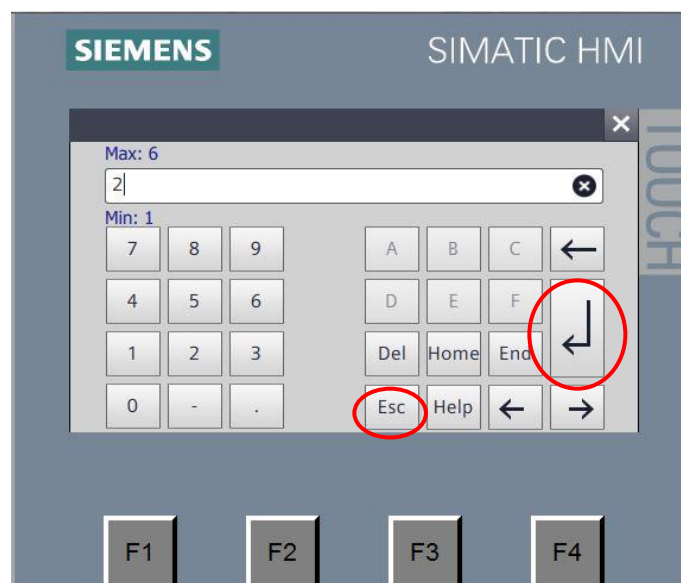
Touch input panel:

Allows user to enter values and parameters.

ESC to return to previous page without making changes.↵ to acknowledge (enter).

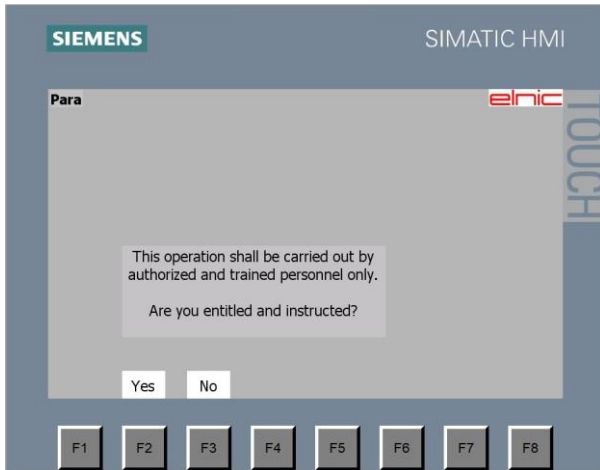
NOTE : For some screens only, on top left : the screen gives max and min values, which may be entered. The value depends on what parameter has to be entered.

This key pad is used for several entries as explained in this manual.



2.4.3. Maintenance – Safety query

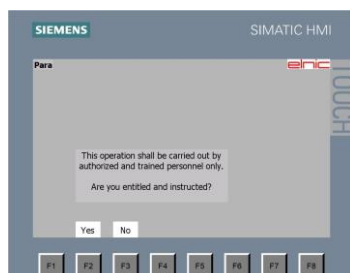
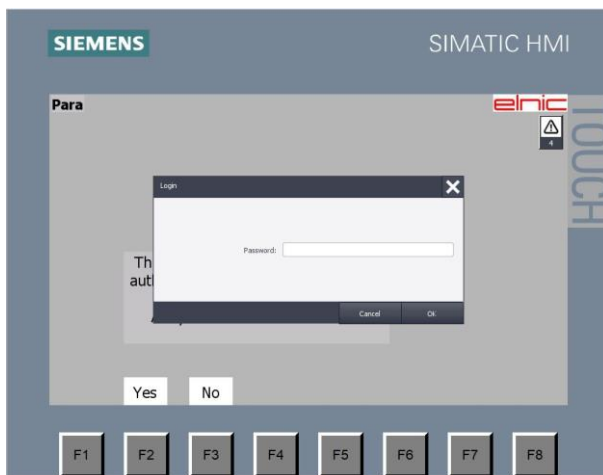
This page informs the user that only trained service personnel is allowed to enter this menu.



F2 = Yes leads user to window which requires password.
F3 = No returns to starting screen.

2.4.4. Password screen

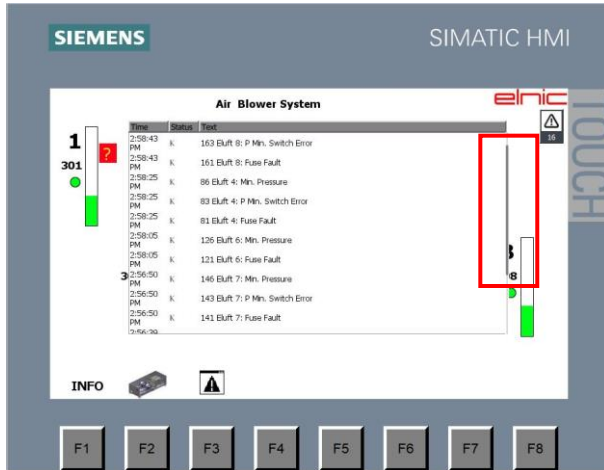
Enter the password by tapping the correct letters or digits on the screen. The entered password shows as stars. Then tap ↵ to confirm. Confirm again by tapping OK. The screen disappears, screen “maintenance” is shown. Tap **F2** YES for maintenance control screen.



The password entry is valid for about 5 minutes. A message “user logged off” appears when the session is over. To make further changes, please enter password again.

2.4.5. List of current errors

This screen displays the current and non-acknowledged errors. It shows as soon as a new error occurs.



F1 = Warning the next screen with a list of all errors is shown.

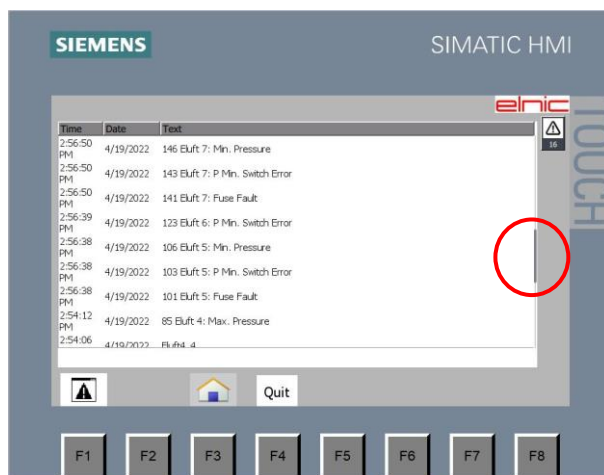
F3 = Home the starting screen appears.

F4 = Quit → the selected error is acknowledged.

The small bar on the side is to scroll up and down in the list.

Each selected message (grey background) can be acknowledged by tapping the small exclamation mark.

2.4.6. List of all errors



Displays a list of all errors.

The small bar on the side is to scroll up and down in the list.

F3 = Home the alarm screen is shut down. The starting screen appears.

2.5. Remote Access Feature to be used with MCU – webserver - option

This feature allows worldwide remote access to the operation display of the Master Control system via **modem**. A regular PC with modem connection and an elnic software application acts as extended screen and allows displaying any information in parallel, provided by the Control Panel. Local technical assistance is made easy by the possibility to check all operation, failure and preset parameters from specialists of the membrane suppliers. In order to be able to use this feature, the unit needs to have a master control system and internet access.



Login for remote access

AIR Blower System			
Pressure	pressure setpoint	300 Pa	
	current pressure	297 Pa	
Speed	blower 1 speed	27 %, Auto	
	blower 2 speed	0 %, Auto	
Operating hours	system	2 h 15 min	
	blower 1	2 h 3 min	
	blower 2	1 h 7 min	
Status	Status	not functional	
	Communication	OK	fuse fault
	P Min switch	OK	P Max switch
	min pressure	no	max pressure
		no	

Call up the page with this link using the web browser either directly via PC or via an available network and router:

<http://192.168.7.60/awp/index.html>

The web page has been configured for up to 7 eluft stations.

In the left column you will find an overview of the eluft stations.

If the station is not connected, has a communication error or another error message a yellow diamond with an exclamation mark ⚠ shows up next to the eluft no.

eluft stations that work properly are marked with a tick in a green circle ✓.

So the left column shows a first status on the overall system.

The detailed data for the single stations is shown after choosing the corresponding station in the left column. (the respective selected station has a **black background**)

The values shown on the website are updated every 10 seconds.

2.6. Wireless Access Point (WAP) to be used with air machines or MCU

For most eluft stations (150-1400, eco) and the master control station, a **wireless access point (WAP)** is available as an option. All eluft functions may be accessed using any smartphone, tablet or notebook using Wireless LAN (WLAN), showing the same display as the logo. The basic settings can be changed and function/error messages checked. The powerful antenna is suitable for outdoor use and provides a good reception at the greatest possible distance.

The standard eluft systems (150-1400, ECO) can be connected via a LAN port in the control unit to a wireless access point. This antenna is weather resistant and attached to the outside of the eluft station (e.g. on a pole or a wall). Within the transmission range devices which are capable of wireless reception (e.g. smart phone, tablet or notebook) can dial into the eluft and show the contents of the internal display on the device. The user can control and administer the eluft. If the wireless access point is connected to a Master Control Unit, the same data can be displayed locally as described under remote access feature.



WAP antenna

2.7. Webserver Control for eluft using IP-address and mobile application

It enables our customers to view data from the logic controller inside the air machine on a LAN-connected appliance such as a smart phone, tablet or PC, displayed in a graphical, professional man-machine interface (MMI).

Requirements

- eluft air machine with a LAN-capable logic controller inside. These are meanwhile standard in elnic air machines from sizes eluft 150-1400 and all eco machines.
- LAN connection, either via LAN cable or via Wi-fi with our Wireless Access Point (WAP). Our WAP can be ordered extra for all eluft air machines (150-1400 and eco).
- our latest webserver software including password.
- a device of your choice, which is connected via Wi-fi or LAN.

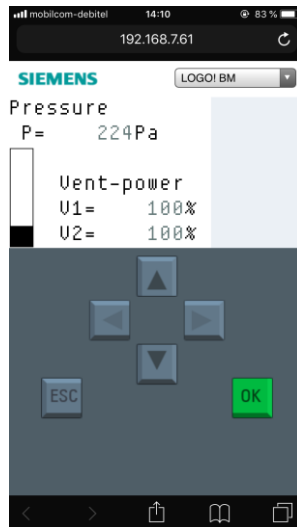
Features

- shows real-time data from the (connected) eluft unit(s)
- offers access to the diagnose pages
- shows if errors occur in the system (in red)
- offers access to the standard Logo interface using a separate password for changing settings on the machine

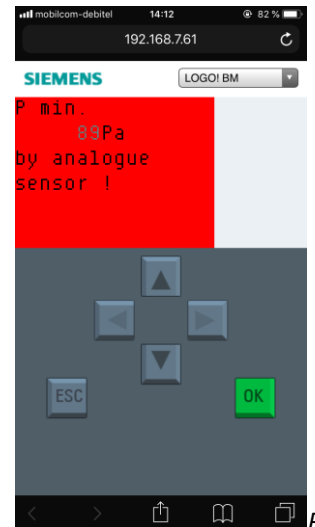
Examples of a PLC (pict 1-3) and data screens on a smartphone (Webserver, pict 4-5)



1 Login screen smartphone



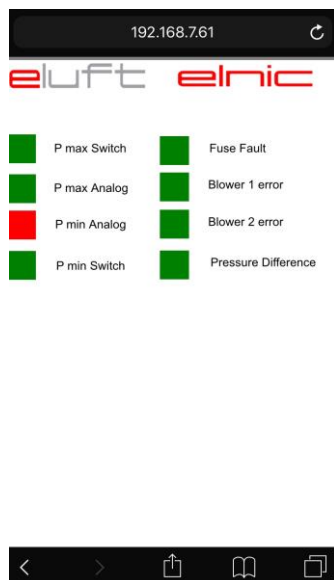
2 PLC real-time data



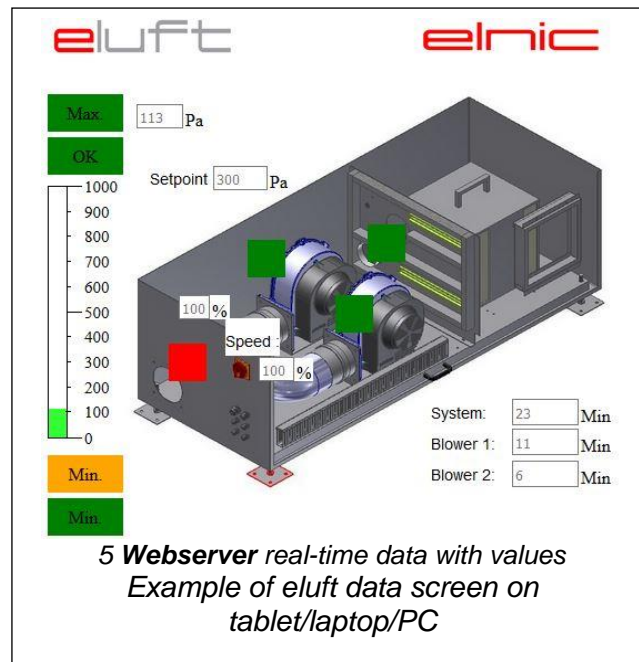
3 PLC error screen

When switching through the pages, further values and details are shown. These screens are available in all variable sizes (mobile, tablet, laptop, PC screen). The above are standard views.

In addition, the **Webserver** has a **customized site**. This user interface makes it easier and faster to check the status. Compare screenshots 3 and 4, both showing an analog sensor error. The eluft screen (5) even shows an overview of the whole eluft machine.



4 Webserver error screen



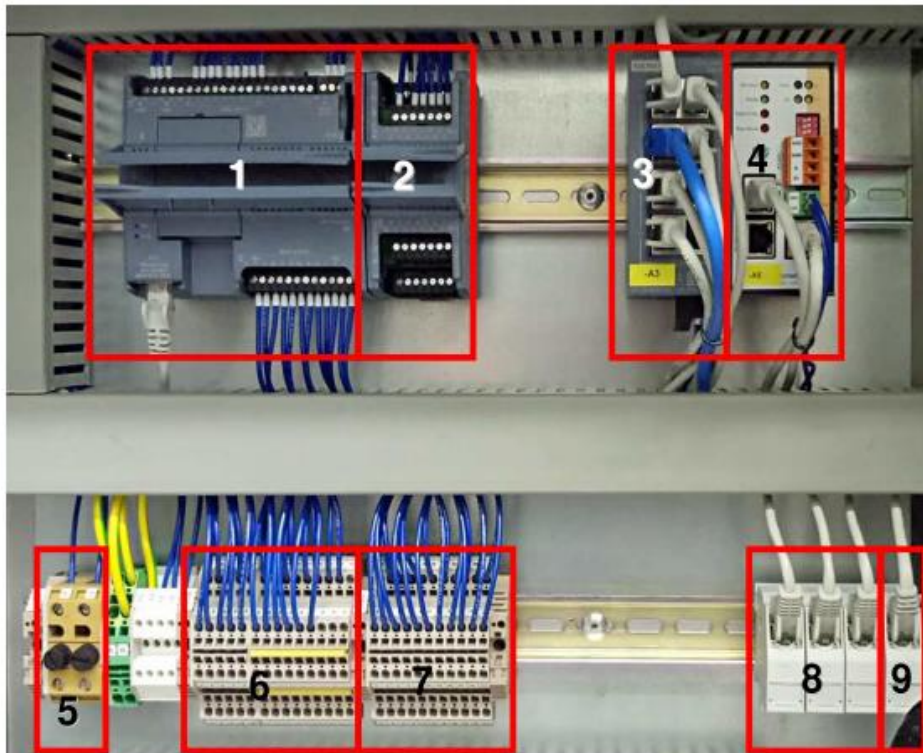
5 Webserver real-time data with values
Example of eluft data screen on
tablet/laptop/PC

This webserver screenshot with real-time data shows the analog sensor has an error signal (red square). All other squares are green, meaning these parts are OK.

2.8. BACnet feature to be added to the MCU or Modbus TCP to eluft machine

A hardware controller (see no. 4) can be added to the MCU providing live data of all connected machines. This is an example of the MCU switchboard incl. description of the parts.

Similar to this, a Modbus TCP can be added to the air machine switchboard.



- 1 CPU (Central processing unit).
- 2 Digital port.
- 3 Network switch.
- 4 BACNET Protocol Converter.
- 5 Mains supply.
- 6 Connection to wind and snow height sensor.
- 7 Dry contacts to building management system.
- 8 Network connection to eluft stations.
- 9 Network connection to BMS.

These are the live signals made available for the BACnet or Modbus TCP:

C.N.	Object Name	Object Description	Type	UNITS	RANGE
		ALL signals read only !			0 / 1
1	1_B_OK	Eluft_1_OK	DI		Error / OK
2	1_B_Fault_Com	Eluft_1_Communication error	DI		norm/alarm
3	1_B_Fuse	Eluft_1_Fuse fault	DI		norm/alarm
4	1_B_Fault_Blower_1	Eluft_1_Blower 1 error	DI		norm/alarm
5	1_B_Fault_Blower_2	Eluft_1_Blower 2 error	DI		norm/alarm
6	1_B_Pmin_Switch	Eluft_1_Pmin Switch error	DI		norm/alarm
7	1_B_Pmax_Switch	Eluft_1_Pmax switch error	DI		norm/alarm
8	1_B_Pmin	Eluft_1_Pmin error analogue	DI		norm/alarm
9	1_B_Pmax	Eluft_1_Pmax error analogue	DI		norm/alarm
10	1_I_Pressure	Eluft_1_current Pressure	AI	Pa	0-1000 (-1 if communication error)
11	1_I_Setpoint	Eluft_1_Setpoint	AI	Pa	0-1000
12	1_I_Snow	Eluft_1_Snowheight	AI	mm	0-800 (-305 .. -1 if sensor error)
13	1_I_Blower_1_Speed	Eluft_1_Speed Blower 1	AI	%	0-100
14	1_I_Blower_2_Speed	Eluft_1_Speed Blower 2	AI	%	0-100
15	1_D_Operating_time_System	Eluft_1_Operatinghours System	COUNT	h	0-99999
16	1_D_Operating_time_Blower_1	Eluft_1_Operatinghours Blower 1	COUNT	h	0-99999
17	1_D_Operating_time_Blower_2	Eluft_1_Operatinghours Blower 2	COUNT	h	0-99999