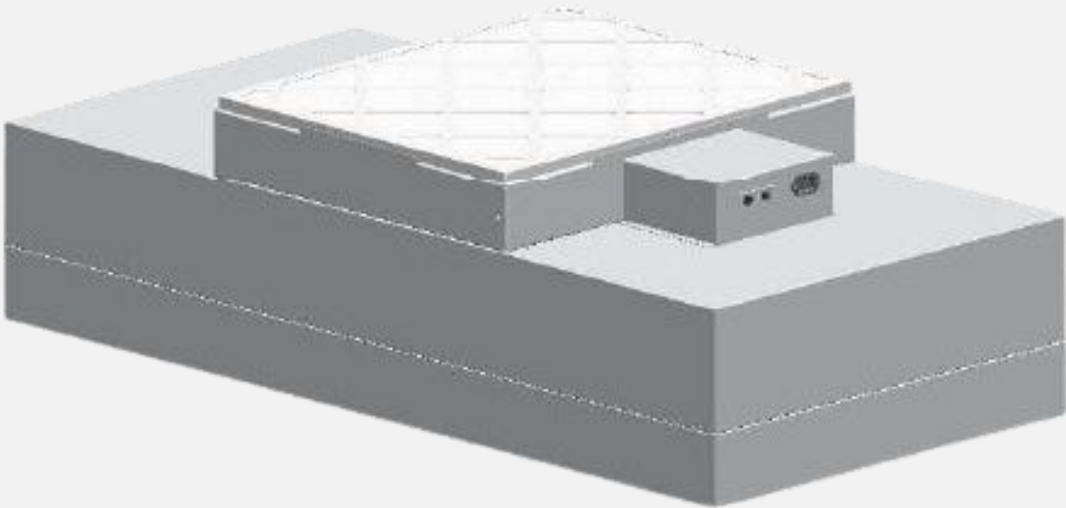# ADS LAMINAR FFU NETWORKS CONFIGURATION GUIDE

2024

1. Overview

Dear customer, ADS Laminar company, is very pleased with your choice of equipment we produce.

Our equipment meets the highest requirements of all industrial structures.

Contents
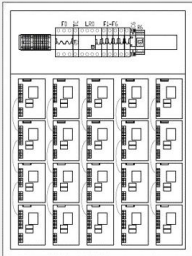
3.FFU components

- Essential components

1		**FAN CONTROLLER CARD** **RS485/MODBUS TCP IP**
2		**Blower Motor**
3		**Fan controller cable**
4		**Fan power cord** **220VAC**

- Optional components

1		**PLC-HMI** **DC-PRO 7 All in one**
2		**Room synoptic interface** **For sample only**
3		**Communication electrical** **Box** **For sample only**
4	Eole2 software or Flower Mode card	**RS485**

4. Blower Motor

Our FFUs are equipped with fans from the Swegon company, here is brief information about them.

TAC fans (with forward blades) are centrifugal fans provided with impulse turbines with many narrow, direct-drive blades in which the motor is placed in the air stream. The blades are set forward and tilted in the direction of rotation. All the fans of the range, volutes, and turbines are made of galvanized steel (DIN 17162). Each fan is statically and dynamically balanced to provide silent, vibration-free operation.

TAC, which stands for Total Airflow Control, is based on the construction of aerodynamic models and on the latest developments in motors, such as the electronically commutated motor (ECM). This technology is applied to airflow control and has made it possible to create a new range of standard fans fitted with these motors: the TAC series.

This technology has allowed us to produce extremely efficient fans, regardless of the speed of rotation.

In addition, TAC fans have the following advantages:

- ECM motor = at least 50% energy savings (compared with the standard AC motor).

- Constant airflow regardless of the pressure drop, constant pressure, link with 0/10 V signal, etc.

- Easy installation: the requested airflow is the same as the obtained airflow, with no complicated, tedious adjustments.

- Lower noise levels than conventional airflow control technologies.

- Compliant with European energy requirements (ErP 2013/2015)

The ECM motor

The ECM motor used is a direct-current, permanent-magnet motor, but it is supplied with alternating current. An added electronic module is secured to the motor, which provides the commutation of the rotor and controls the operation thereof. This ECM motor is capable of accurately communicating the instantaneous value of its working point. Based on this information, we have developed instantaneous calculation models of the working point of the fan. The permanent availability of this information opens the door to many smart uses. TAC technology uses this information to control the fan according to the needs of the application.

5. FAN Controller card

Our controller is constantly improving and allows complete control of the operation of the fan according to the customer's requirements and provides various types of regulation for fans.

Switching between modes is done via the WEB page of the controller.

- ## Stand Alone Mode

In this mode, the setpoint and parameters are written via the web page. An

Ethernet cable can be connected to RJ45 port P4 or P5.

The card embeds a web server accessible on port 80 with a browser at http://ffu<serialnumber>.
Local
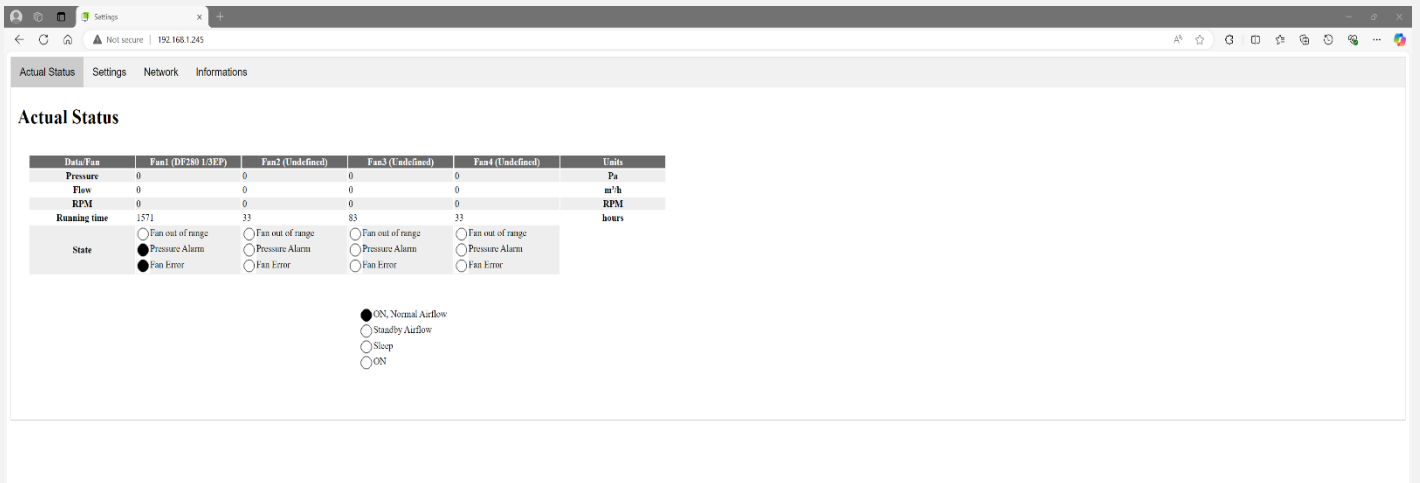
Example with card serial number **1335389**:

http://ffu1335389.local/

Of course, you can access directly by the IP address:

Example:

http://192.168.1.218/

Note: type **http://** in your browser

If you do not mention this, the browser could replace it by **https** and will try to communicate in secure way, what will be wrong.

- ## Modbus Mode

  - ### Connection

The cards respond to TCP Modbus on port 502.

The connection is open until the master closes it.

Ethernet cable can be connected to RJ45 port P4 or P5.

  - ### Modbus list

Register Name	Register	Function code	Remarks
K1 activated	56	3/6/16	0/1
Pressure alarm Fan1	57	3/6/16	Pa
Pressure alarm Fan2	58	3/6/16	Pa
Pressure alarm Fan3	59	3/6/16	Pa
Pressure alarm Fan4	60	3/6/16	Pa
Q setpoint Fan 1	61	3/6/16	m³/h
Q setpoint Fan 2	62	3/6/16	m³/h
Q setpoint Fan 3	63	3/6/16	m³/h
Q setpoint Fan 4	64	3/6/16	m³/h
Fan type (Fan 1)	65	3/6/16	0 = Not used
Fan type (Fan 2)	66	3/6/16	0 = Not used
Fan type (Fan 3)	67	3/6/16	0 = Not used
Fan type (Fan 4)	68	3/6/16	0 = Not used
DHCP enabled	200	3/6/16	0/1
TCPIP address H	201	3/6/16	0…255
TCPIP address MH	202	3/6/16	0…255
TCPIP address ML	203	3/6/16	0…255
TCPIP address L	204	3/6/16	0…255
TCPIP netmask H	205	3/6/16	0…255
TCPIP netmask MH	206	3/6/16	0…255
TCPIP netmask ML	207	3/6/16	0…255
TCPIP netmask L	208	3/6/16	0…255
TCPIP gateway H	209	3/6/16	0…255
TCPIP gateway MH	210	3/6/16	0…255
TCPIP gateway ML	211	3/6/16	0…255
TCPIP gateway L	212	3/6/16	0…255

Read Only Registers

Register Name	Register	Function code	Remarks
Airflow Fan 1	50164	3	m³/h

Pressure Fan 1	50165	3	Pa
RPM Fan 1	50166	3	rpm
PWM Fan 1	50167	3	0...255
V1 Fan 1	50168	3	0...10 000mV
V2 Fan 1	50169	3	0...10 000mV
Spare Fan 1	50170	3	-
State Fan 1	50171	3	** See below
Error Fan 1	50172	3	Not used
		3	
Airflow Fan 2	50264	3	m³/h
Pressure Fan 2	50265	3	Pa
RPM Fan 2	50266	3	rpm
PWM Fan 2	50267	3	0...255
V1 Fan 2	50268	3	0...10 000mV
V2 Fan 2	50269	3	0...10 000mV
Spare Fan 2	50270	3	-
State Fan 2	50271	3	** See below
Error Fan 2	50272	3	Not used
		3	
Airflow Fan 3	50364	3	m³/h
Pressure Fan 3	50365	3	Pa
RPM Fan 3	50366	3	rpm
PWM Fan 3	50367	3	0...255
V1 Fan 3	50368	3	0...10 000mV
V2 Fan 3	50369	3	0...10 000mV
Spare Fan 3	50370	3	-
State Fan 3	50371	3	** See below
Error Fan 3	50372	3	Not used
Airflow Fan 4	50464	3	m³/h
Pressure Fan 4	50465	3	Pa
RPM Fan 4	50466	3	rpm
PWM Fan 4	50467	3	0...255
V1 Fan 4	50468	3	0...10 000mV
V2 Fan 4	50469	3	0...10 000mV
Spare Fan 4	50470	3	-
State Fan 4	50471	3	** See below
Error Fan 4	50472	3	Not used

***

Bit 0 : K1, normal airflow
Bit 1 : K2, standby airflow
Bit 2 : Spare
Bit 3 : Sleep
Bit 4 : Out of range
Bit 5 : Alarm 1
Bit 6 : Alarm 2
Bit 7 : fan on

- ## Alarm in TCP/IP

For the cards connected by ethernet (standalone or Modbus), the alarms are sent in multicast.

Then the alarm on one card in the network will be replicated to all cards.

Each card listens on port 239.0.0.51 port 5140 the status of all cards connected on the network. Each card sends an error on the same address/port.

An alarm will be activated:

Rel1: in case of no RPM when the fan is activated.

Rel2: in case of pressure alarm

Note about the Relay module:

The relay module is purchased separately

A network alarm will activate immediately the relays. But the reset of the alarm works by a time-out of 15 seconds.

If a card in alarm is disconnected from the network, the alarms on the other cards are reset after a maximum of 15 seconds.

A card that is not in an alarm doesn't send a frame on the network.

- ## Eole2/Flower Mode

The new cards have 4 fans output.

To get a backward compatibility with Eole2 which communicates with only one fan at a time, the new FFU should be addressed by a multiple of 4, starting at 0.

Note about flower keypad:

The flower keypad only accepts FFU with address 0 in a special configuration.

It is recommended to avoid address 0, in consequence the fan 1 should be not connected on FFU starting with address 0.

On the next addresses you can connect all the 4 fans.

Example:

First FFU RS485 Address 0:

Fan 1 = 0 on Eole2 (This should not be used with the flower keypad)

Fan 2 = 1 on Eole2

Fan 3 = 2 on Eole2

Fan 4 = 3 on Eole2
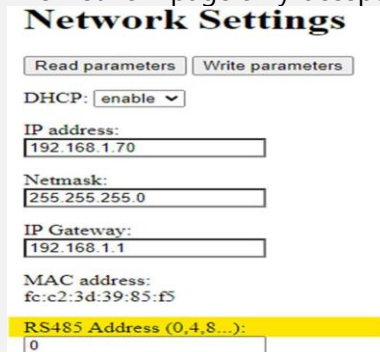
Second FFU RS485 Address 4:

Fan 1 = 4 on Eole2

Fan 2 = 5 on Eole2

Fan 3 = 6 on Eole2

Fan 4 = 7 on Eole2

...

The Network page only accepts a multiple of 4, starting at 0.

Network Settings

[Read parameters] [Write parameters]

DHCP: [enable ∨]

IP address:
192.168.1.70

Netmask:
255.255.255.0

IP Gateway:
192.168.1.1

MAC address:
fc:c2:3d:39:85:f5

RS485 Address (0,4,8...):
0

6. Type of topology for Modbus TCP/IP

- ## Control box

In this configuration, all control boards are in the control cabinet.

in this case, the motors are connected by control cables to the boards concentrated in the main control box.

 The length of the control cables must be agreed upon between the parties.

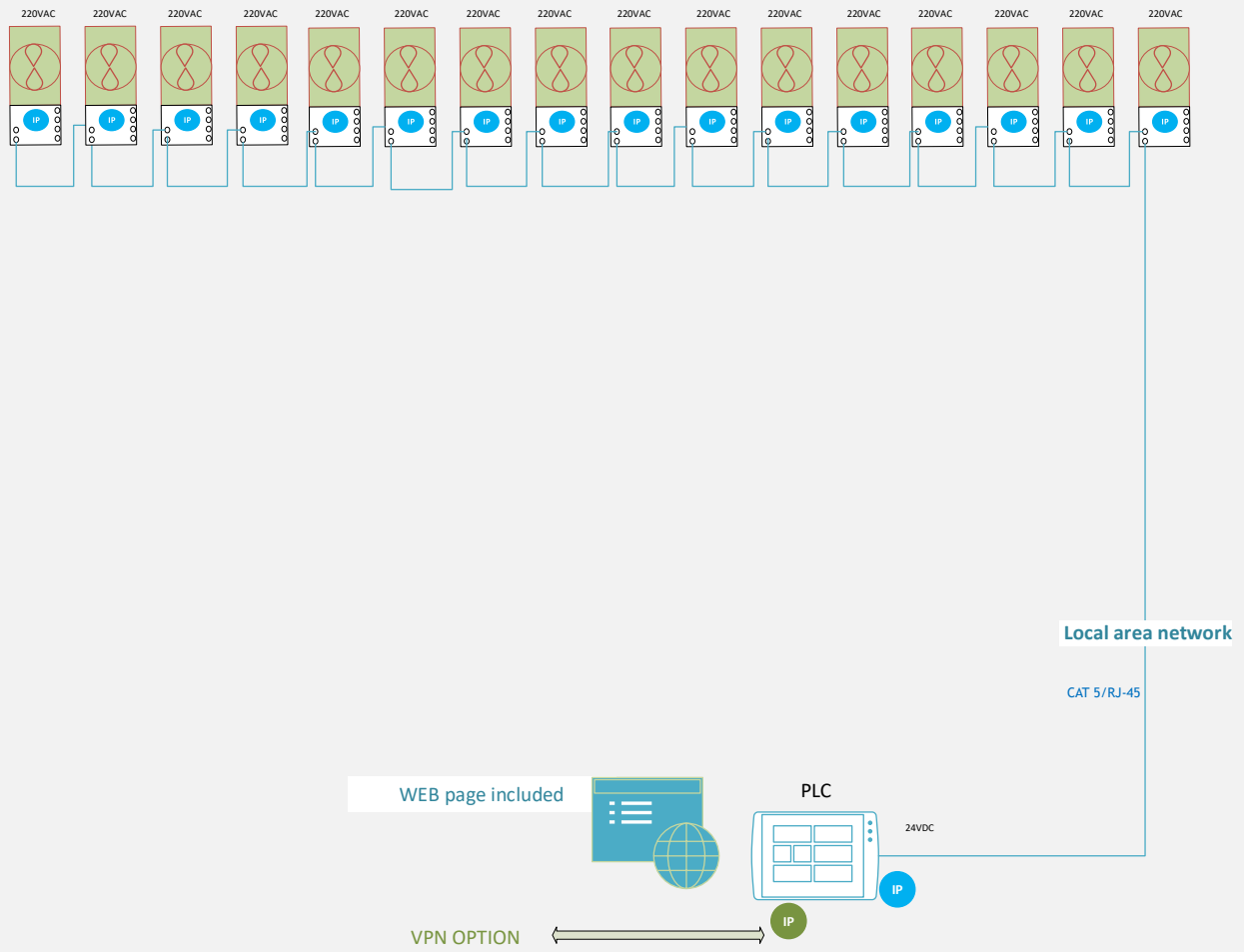At the customer's request, the network can be connected to PLC for Modbus TCP/IP protocol.
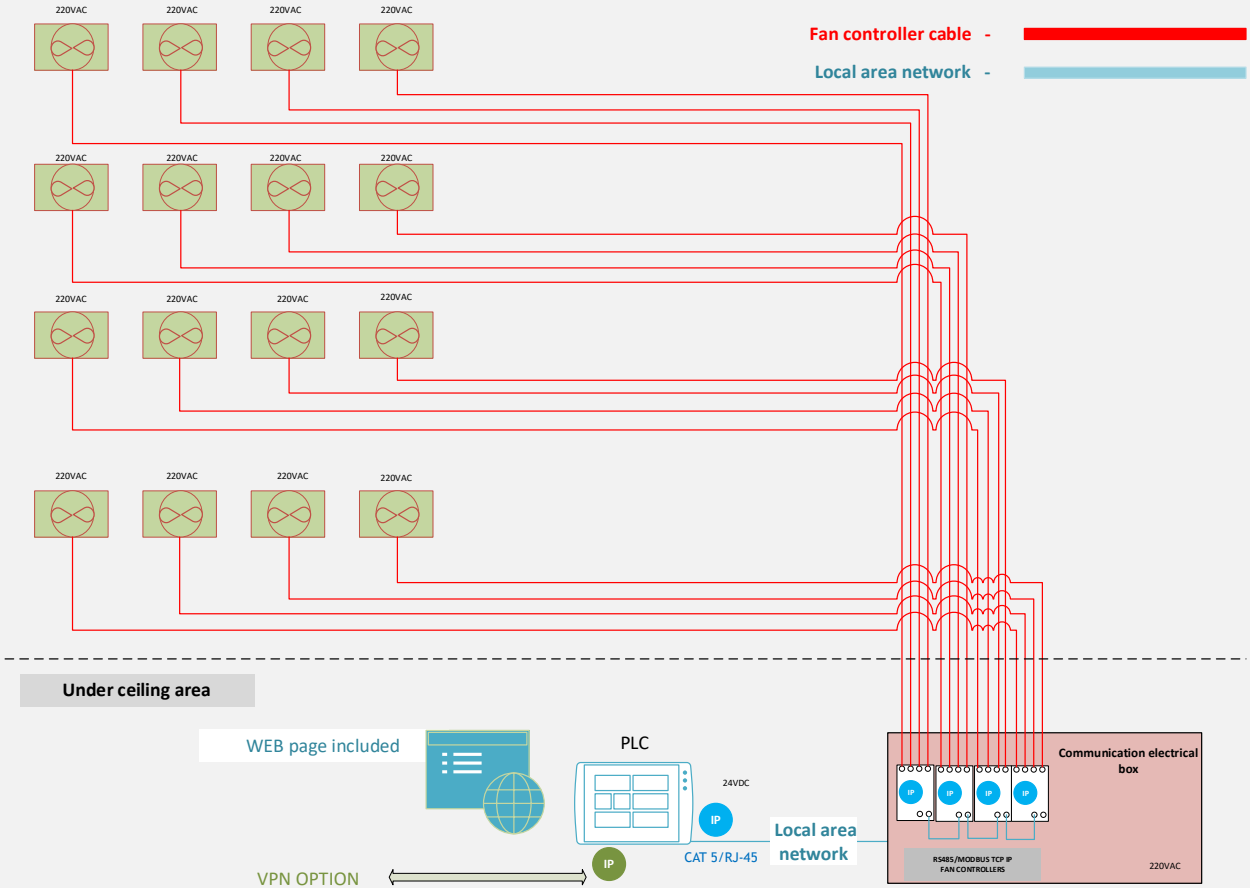
- ## FFU with control card

In this case, each FFU has a control card, only one fan connected to the control card

All control cards are connected in series.

At the customer's request, the network can be connected to PLC for Modbus TCP/IP protocol.

• Above-ceiling control card

In this configuration, the control board is located next to the group of four fans and therefore next to the next segment of four motors, and so on.

The cards are connected using an RJ45 cable. Each card has two LAN ports so they can be connected in series. At the customer's request, the network can be connected to PLC for Modbus TCP/IP protocol.
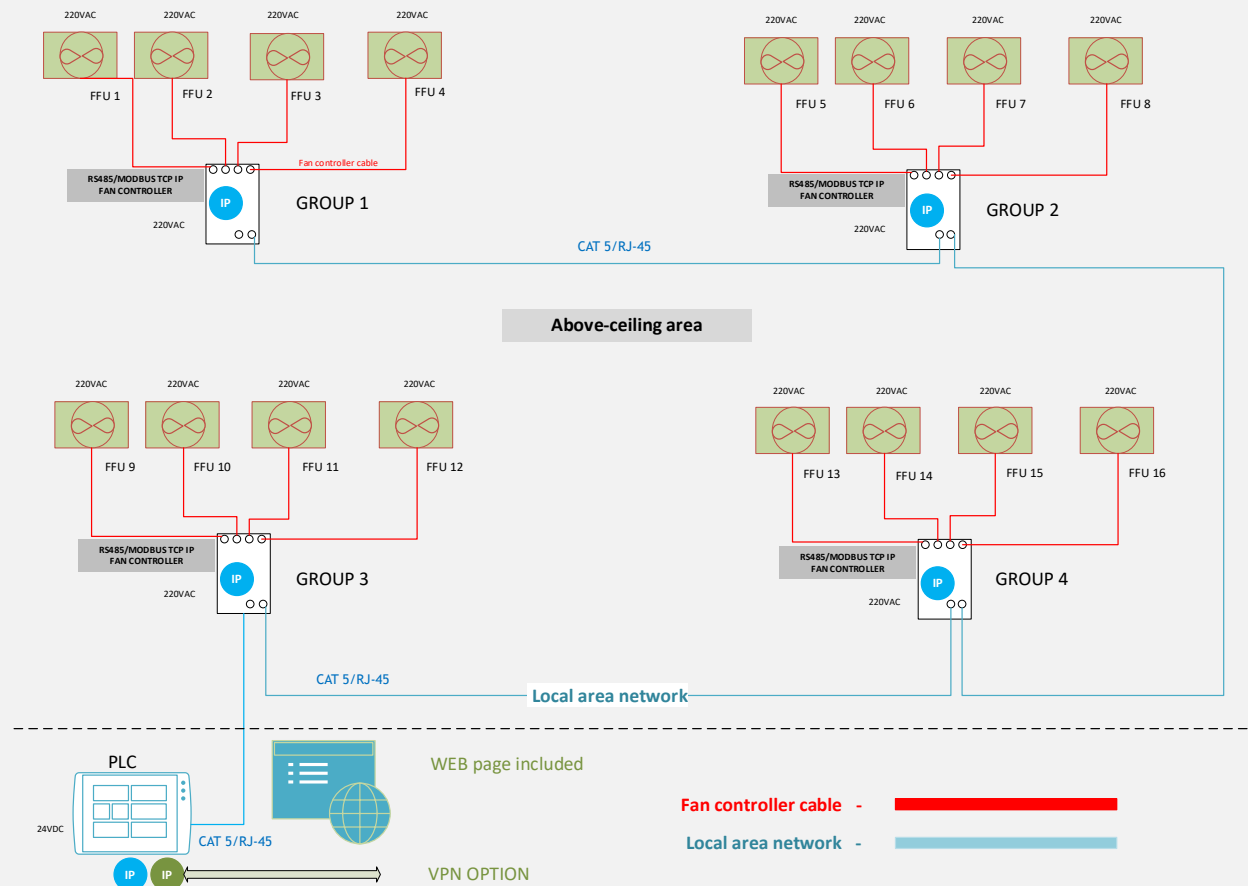
The system configuration must be agreed upon in advance

7.References

- TAC forward-blade fan technical documentation - P. LEMMENS SWEGON GROUP COMPANY
- Technical documentation -DVC COMPANY