



**INFORMATION and TECHNICAL DESCRIPTION**



Professional  
**airleader**

**Compressor management**

- Automatically optimised
- self-learning
- simple installation and operation



WF STEUERUNGSTECHNIK GMBH

## **AIRLEADER** *Professional* **Compressor Management** + Compressed Air Visualisation + Alarm Service Management +

- AIRLEADER**
- has been the effective answer for compressed air users for more than 10 years
  - for the optimum compressor combination at any time
  - suitable for the current compressed air consumption
  - with proven lower costs and wear of the compressors.

Several studies have shown that the costs for compressed air generation are up to 30% higher than they should be. About 10% of the energy in the industry is used for compressed air generation with an increasing demand.

- AIRLEADER**
- is self-learning
  - with automatic optimisation
  - is easy to handle
  - monitors the compressed air station
  - informs on service and fault messages

Compressed air is an important matter. Thus, in more than 20 years of planning and sales of compressor stations, the demands of the compressed air users have been compiled and have been realised in the new series **AIRLEADER Professional**.

- AIRLEADER**
- shows the current compressed air consumption
  - keeps the pressure constant
  - monitors the pressure dew point
  - integrates the frequency-controlled compressor
  - dynamises the process of the compressed air stations

The costs for compressed air generation are being reduced by up to **27%** when **AIRLEADER** reduces the load kW costs up to **20%**, the idle running kW costs up to **99%**, the wear with the compressors by more than **50%** and the service costs by **30%**.

**Compressor-Management is the first step of a program for saving compressed air costs.**



## 1. Expansions at the AIRLEADER controller

1. an operating system is played into the controller. The program flow only is on the Eprom
2. optimizing the compressor combinations dynamically and automatically by 8 selflearning calculation processes adapted to the real air consumption. For lower energy costs
3. Dynamicly compressor changings at equally compressors without pressure drop within the pressure band
4. active processing of the analog signal of the various speed regulated compressor
5. free programmable maximum regulation range for speed regulated compressor
6. free programmable minimal regulation range for speed regulated compressor
7. direct switching on further compressors in the pressure band if production needs more compressed air
8. direct switching off compressors within the pressure band if the speed regulated compressor has reached its minimal regulation range
9. Analog output for the external pressure advertisement over the pressure area
10. Analog output for the external compressed air consumption advertisement
11. Analog input for the supervision of the pressure dewpoint or room temperature
12. Alarm report when dewpoint or pressure, over or underrun the limited values
13. Dewpoint at the display (press + button)
14. 30 times faster communication between AIRLEADER the PC and Master-Slave

## 2. Expansions at the PC Program

1. Windows 2000 and WINDOWS XP fit
2. Dewpoint diagram to show the damp in the compressed air
3. Compressed air consumption, pressure and pressure dewpoint
4. advertisement in numbers in every view
5. Compressors status advertisement for every view in the status strip
6. Zoom lens areas 1, 3, 6 12 24 hours
7. Alarm and service report supervises service intervals and writes events like service transgression and disturbing reports in the monthly report



## **1. Compressor-Management-System**

AIRLEADER combines compressors of different sizes to an optimum unit which automatically adapts to the production based on the current compressed air consumption.

It is made sure that it is always the most efficient compressor combination which generates the compressed air necessary for production, independent of the manufacturer and the performance. The system pressure remains within the smallest limits. It is seen that the costs are kept as low as possible.

The compressor performances and a common pressure difference are programmed in for all the compressors. Based on this information, AIRLEADER permanently calculates the current compressed air consumption and the volume of the compressed air system.

The self-learning 8-fold calculation depth makes it possible to adapt the compressors to the changes in consumption in a dynamic way.

### **Automatic compressor change as per compressed air consumption:**

If all the compressors are on the same rank, they are working fully automatically and based on consumption. The priority of the compressors is adapted to the production process in real time and with a useful hysteresis calculation.

It is always the compressor combination with the lowest cycle rates which is running and thus with the lowest idle times.

Big compressors are only running when needed. The smaller compressors are running under load instead of idling with the big compressors.

The compressors auto-regulate the motor start limitations.

### **The speed-controlled compressor is actively integrated**

The speed-controlled compressor transmits the information on the motor speed via its analogous output.

Parameterisation is effected as to the minimum and maximum quantity delivered in the AIRLEADER.

The analogous signal allows to continuously add further compressors with higher consumption and to remove them with lower consumption using programmable control limits.

If desired, switching over is effected automatically to a normal compressor with a very low compressed air consumption.

### **Manual priorities**

The priority menu allows the compressors to work on different priority levels.

Compressors with a different size having the same priority then work again based on consumption.

This function is frequently used for reserve compressors or for compressors with heat recovery.



## 2. Additional control functions

### Compressor running time compensation

For compressors with the same performance, a change time for the same operating hours can be programmed when they are on the same priority.

Each compressor performance group can be programmed using a different change time.

The change is effected taking the motor running times into account.

If a compressor has reached the programmed time difference to the compressor with the lowest time in the same performance group, the compressors are exchanged without any pressure loss within the pressure range.

### The real time switch with multifunction has the following functions:

- Switch the compressors ON at production start and OFF at production end
- 3 programmable pressure profiles for pressure increase and pressure reduction
- switch 3 different manual priorities dependent on the time
- switch 2 additional devices such as dryer or valves ON/OFF

## 3. Compressor inputs

The status of the compressors is constantly monitored.

If a running compressor displays a malfunction within the pressure range or is switched off for service, its **performance is taken over by other compressors**.

If several compressors are needed to do this, addition is made time-delayed.

Load and total running times are stored for the individual compressors.  
The operating hours are deleted, if required.

## 4. Information on the user display

### The following information is permanently shown on the display:

- Compressed air consumption in m<sup>3</sup>/min
- current system pressure in bar
- Pressure dew point in °C (at the click of a button)

### Compressor status is displayed with the three-colour LEDs:

green	Compressor conveys
yellow	Compressor is idling
red	Compressor displays a malfunction
red blinking	Compressor is switched off
LED off	Compressor is ready for use

## 5. Programming

### Programming is effected using 4 keys

Enter key	opens programming and confirms it
▢ Cursor	scrolls within the menus
+ key	increases the value
- key	reduces the value



## 6. Digital inputs and outputs

### Digital inputs for:

1. START/STOP of the compressors externally
2. Programming release
3. Time switch activation
4. second pressure profile or second priority

### Digital outputs for:

1. Minimum pressure and malfunction of unit as well as exceeding of dew point
2. Collective fault compressors
3. two time switch outputs for switching of additional devices such as dryer, filter etc.

## 7. Analogous inputs and outputs

### Analogous inputs 4-20 mA for:

1. Pressure transmitter for pressure monitoring (Standard 0-16 bar)
2. Signal of speed-controlled compressor via speed
3. Monitoring of ambient temperature or compressed air humidity using the dew point sensor

### Analogous outputs 4-20 mA for:

1. Pressure range over the range preset by the pressure transmitter
2. Compressed air consumption in m<sup>3</sup>/min up to the maximum performance of the compressors

## 8. Scope of delivery of Hardware

Triggering of the compressors is effected using the relay cards supplied with potential free change-over contact.

Each compressor informs of its status such as motor running, malfunction and readiness for use via contacts.

<b>AIRLEADER</b>	in metallized housing for wall mounting
<b>Relay card</b>	for every compressor (top hat rail mounting in compressor control cabinet)
<b>Transmitter</b>	for the current pressure detection with analogous output 4-20 mA
<b>RS-485</b>	serial interface for PC und Master-Slave connection

## Technical details and list of equipment

<b>AIRLEADER Professional</b>	<b>2</b>	<b>4</b>	<b>8</b>	<b>Master 4</b>	<b>Master 8</b>	<b>Slave 2</b>	<b>Slave 4</b>	<b>Slave 8</b>
Number of compressor connections	2	4	8	4	8	2	4	8
Number of controlled compressors	2	4	8	8	16	2	4	8
Compressor LED for -LOAD,-IDLING,-MALFUNCTION	2	4	8	8	16	2	4	8
Inputs for compressor fault messages	2	4	8	4	8	2	4	8
Inputs for motor running messages of compressor	2	4	8	4	8	2	4	8
Inputs for readiness for use of compressor	2	4	8	4	8	2	4	8
Interface relay cards for compressor control	2	4	8	4	8	2	4	8
Control compressors by compressed air consumption	Series	Series	Series	Series	Series			
Common pressure difference for all compressors	Series	Series	Series	Series	Series			
Programming management via display	Series	Series	Series	Series	Series			
Connection of a frequency-controlled compressor	Optional	Series	Series	Series	Series			
Connection of a sensor for dew point or ambient temperature	optional	Series	Series	Series	Series			
Manual setting of compressor priorities	Series	Series	Series	Series	Series			
Pressure transmitter supply	Series	Series	Series	Series	Series			
Remote ON/OFF	Series	Series	Series	Series	Series			
Operating/fault message LED	green/red	green/red	green/red	green/red	green/red			
Minimum pressure and device malfunction output 24VDC	1	1	1	1	1			
Compressor fault message output 24VDC	-	1	1	1	1			
<b>Multi function time switch for:</b> 3 pressure profiles, -3 compressor priorities control system ON/OFF, 2 switching outputs for triggering of additional devices (e. g. dryer or automatic actuators etc.)	Series	Series	Series	Series	Series			
Interface RS 485 for PC and Slave connection	Series	Series	Series	Series	Series	Series	Series	Series

We reserve the right to technical modifications

### Technical data:

Mains voltage	230	V AC 50 Hz
Compressor performance	0.1 - 200	m <sup>3</sup> /min    OPTION:    CFM
Pressure range	0 - 16	bar    OPTION:    0 - 2.5 bar    0 - 50 bar    0 - 400 bar    Vacuum    0 to -1 bar
Minimum pressure difference	0.3	bar    OPTION:    0.03 bar
Inputs and outputs	24	V DC
Cable ducts	Thread	M 16 x 1.5



## AIRLEADER *Professional* „Compressed Air Visualisation“ + with SERVICE and ALARM Report +

### 1. Compressed air visualisation

The PC program „Compressed air transparent“ records the control process up to one second. At any time, it is possible to persuade oneself of the fact that the compressed air volume necessary for production is generated by the suitable compressor combination. Different diagrams show the efficiency of compressed air generation.

The integrated calculation program lists the running times of the compressors as to load and idle times and calculates the energy consumption. The capacity and the work load of the compressors compared to the energy used gets more transparent. This makes a more detailed cost control of the compressed air generation possible.

### 2. Diagrams in the Online view

- Compressed air consumption diagram in **m<sup>3</sup>/min**
- Pressure diagram in **bar**
- Pressure dew point diagram in **°C DTP**
- Total diagram for compressed air consumption, pressure and compressor status
- Diagram of the current capacity of the speed-controlled compressor

The status line displays the current status of the compressor in the form of a symbol

- green = Load
- yellow = Idle running
- red = Fault
- blue = not ready

In addition, the **compressed air consumption**, the **pressure** and the **pressure dew point** are shown with digits in the diagram views. (dew point only if a dewpoint sensor is connected)

### 3. Diagrams in the daily evaluation view

- Compressed air consumption diagram in m<sup>3</sup>/min
- Pressure diagram in bar
- Pressure dew point diagram in °C DTP
- Total diagram for compressed air consumption, pressure and status of compressors
- Capacity of the speed-controlled compressor
- Load time, idle time, fault message of compressors switched off for service
- Efficiency diagram as per load and idle running Kilowatt
- Energy calculation table with compressed air consumption data

Zoom range 1, 3, 6, 12, 24 hours, for the graphical diagrams

### 4. Diagrams in the weekly evaluation view

- Compressed air consumption diagram in m<sup>3</sup>/min up to 7 days in different colours
- Energy calculation table with compressed air consumption data
- Efficiency diagram as per load and idle running Kilowatt
- Energy calculation table with compressed air consumption data

The data for the evaluation can be stored weekly, monthly, quarterly or annually.









## **AIRLEADER *Professional* ALARM and SERVICE MANAGEMENT** + informs on fault messages + monitors service intervals +

### 1. The compressed air station communicates automatically

The ALARM and SERVICE MANAGEMENT is closely working together with the PC program „Compressed air transparent“. Fault messages as well as service messages are stored. Upon activation of the transmitting function, the messages are transmitted via modem or Fritz-Card to fax machines, via e-mail or as short message via SMS to mobile phones. The fault messages and service messages of the compressors and additional devices are recorded up to one second and are stored in the monthly report for alarm and service. Frequently available fault messages allow to determine damages with compressors and production plants at an early time (using humid compressed air). The clear monthly report in tabular form is a real help.

### 2. ALARM messages

The compressors connected to the fault inputs of AIRLEADER are stored and actively processed.

The remaining free inputs allow for the connection of fault messages of filters, Bekomates, refrigeration dryer/adsorption dryer.

### 3. SERVICE messages

With commissioning of the ALARM and SERVICE MANAGEMENT, the total hours and load hours of the compressors are initially programmed. The times thus accumulated are updated every 60 minutes. The intervals of up to 4 freely definable items, such as air filter / oil filter / oil separator / and oil change can be freely determined.

### 4. Monthly report for ALARM and SERVICE messages

The alarm and service messages are stored in a monthly file.

With every new message, the monthly file is sent in tabular form to the address defined before by fax or e-mail. The events are continuously numbered and added with date and time and stored one below the other. In the course of the day, the events are additionally numbered. The monthly report can be printed out at any time using the print menu.

### 5. Sending of messages

- Monthly report via fax
- Monthly report via e-mail
- Short message via SMS

The following selection functions can be determined:

- Alarm and/or service message
- 2 different fax configurations with 3 different fax numbers each
- 2 different e-mail configurations with 3 different fax numbers each
- 2 different SMS configurations with 3 different fax numbers each

### 5. Monitoring of analogous inputs

- Min – Max message with exceeding or not reaching the pressure
- Min – Max message with exceeding or not reaching the dew point
- Monitoring of the capacity of the speed-controlled compressor



## Scope of supply to the AIRLEADER Professional upgrade (Articlegruppe 20)

	AIRLEADER 2	AIRLEADER 4	AIRLEADER 8 and Master 4	AIRLEADER MASTER 8
<p>For AIRLEADER Type 0201, 0401, 0801, 1401, 1801 Witch PC-Programm was delivered</p> <ul style="list-style-type: none"> <li>- Control-program for AIRLEADER in form of an EPROM's</li> <li>- EPROM change tool</li> <li>- assembly instructions</li> <li>- visualization program <b>Update on CD-ROM with Service and Alarm Report</b></li> <li>- operation manual for AIRLEADER and PC-Programm</li> <li>- connection of VSD compressor or dewpoint sensor for AIRLEADER 2</li> </ul> <p><b>Für AIRLEADER Typ 0201, 0401, 0801, 1401, 1801 For still no PC-Program was delivered</b></p> <ul style="list-style-type: none"> <li>- Control-program for AIRLEADER in form of an EPROM's</li> <li>- EPROM change tool</li> <li>- assembly instructions</li> <li>- visualizations program as <b>full version on CD-ROM with Service and Alarm Report</b></li> <li>- operation manual for AIRLEADER and PC-Programm</li> <li>- connection of VSD compressor or dewpoint sensor for AIRLEADER 2</li> </ul>	240,-- €	400,-- €	540,-- €	860,-- €
<b>Additional products for the AIRLEADER Professional UPGRADE:</b>				
DEWPOINT SENSOR , measuring range -50 bis +30 °C DP , pressure max 70 bar with 4-20 mA Analog output				660,--€
<b>ALARM and SERVICE-MANAGEMENT</b> In connection with Visualization PC-programm and modem or Fritz-Card. Messages for alarm and services to Fax, -e-Mail, -SMS. Monthly alarm and service reports. Adjustable intervals for airfilter, - oilfilter, - oilseparator, oil changing time for compressors. A minimum and maximum alarm limit can be set to the dewpoint				460,--€
Interface - RS485<->RS232 to connect AIRLEADER RS485 to PC. Incl. DB-9 cable and power supply				210,--€
Ethernet interface - RS485<->Ethernet with RJ45 connection to computer networks. Freely definable TCP/IP address. <b>Incl. communication software for virtual COM-Port and power supply</b>				410,--€

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We reserve to the right to make technical changes and improvements without notice at any time