Technical Information
MEAC300

Emission Data Evaluation System

Endress+Hauser
People for Process Automation

Described product
Product name: MEAC300
Product version: 4.2
Product variants: MEAC300 D (for German Directives acc. to “BEP”)
MEAC300 EP (for European Directives “IED Power” and “BEP”)
MEAC300 EPW (for Directives “IED Power”, “IED Waste” and “BEP”)

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Legal information

Original document
This document is an original document of Endress+Hauser SICK GmbH+Co. KG.

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1 About this document

1.1 Target groups

This document is intended for trained MEAC users. The following technical knowledge is assumed:

- Legal requirements of the emission data evaluation
- Local (operational) acquisition of the emission data
- Digital data transmission
- Analog measurement technology
- PC technology (e.g. operating system, interfaces)

1.2 Information in this document

- Functional principle of the evaluation
- Creating an evaluation configuration
- Testing and activating an evaluation configuration
- Specifications for classification
- Hardware information

Further documents in which MEAC300 components are described in detail belong to these Operating Instructions (see “Additional documents”).

Various languages can be selected for the MEAC300 User Interface (GUI) (program text English, German or French; see the Operating Instructions for setting). The User Interface menus shown in this document are mostly in English.

1.3 Additional documents

- MEAC300 Operating Instructions
- Technical Information MEAC300 Add-ons (for MEAC Software Options and MEAC Hardware)

NOTE:

▶ Pay primary attention to individual system information (see “Required individual system information”).

1.4 Required individual system information

- Hardware of the relevant MEAC system (PCs, data evaluation units)
- Delivery state of the MEAC software (options, modules)
- Specifications of the relevant plants (emission sources, measuring devices)
- Circuit diagrams
- Requirements on the documentation of emission data
- Manufacturer information on the delivered MEAC system (if present)

NOTE: Risk of incorrect settings and legal consequences

Incorrect settings in the evaluation configuration can mean the MEAC system does not function as intended. Official requirements may not then be met.

▶ Configure the evaluation to meet system-dependent requirements and individual (local) requirements.

1.5 Abbreviations (German/English)

1.5.1 Technical abbreviations

DE	EN	Significance
AMS	AMS	Automatic measuring system
ARE	FGP	Flue gas purification (flue gas desulfurization, DeNOx)
DAE	DAU	Data acquisition unit
EFÜ	ERT	Emission data remote transfer
EPC	EPC	Emission PC
ESG	DSR	Desulfurization rate
G.S.K.	D.S.C.	Hardware identifier of data acquisition unit [1]
KKS	UPI	Unique Plant Identifier
LAI	FCI	Federal Committee Immission
NV	RC	Reprocessing
SKK	SKK	Status Identification and Classification

[1] Gerät.Slot.Kanal/Device.Slot.Channel

1.5.2 Emission values and status

DE	EN	Significance
GW	LV[1]	Limit value
GWÜ	LVX	Limit value exceeded
JM	YM	Yearly amount
JMG	YML	Yearly amount limit
JG	YL	Yearly limit
JW	YA	Yearly value
JW(RV)	YA(AV)	Yearly value on AV basis
JW(RVj)	YA(AVa)	Yearly value on AVaj basis
JW(TV)	YA(DV)	Yearly value on DV basis
K	C	Adjustment
mA	mA	Current raw value
MG	ML	Monthly limit
MGg	MLr	Rolling monthly value
MM	MM	Monthly amount
MMG	MML	Monthly amount limit
MMNg	MANr	Scaled, rolling monthly amount
MMW	MA	Monthly value
MMVg	MAVr	Validated rolling monthly value
MMVg (vor)	MAVr (prev)	MMVg of the elapsed day
MMWg	MAr	Rolling monthly value
MN	MN	Scaled momentary value
MR	MR	Momentary raw value
MU	MU	QAL2 uncorrected momentary value [2]
MV	MV	Validated momentary value
MW	MD	Momentary value
MZ	MT	Measuring time
RG	AL	Average limit
RM	STM	Average amount
RN	AN	Scaled average value [3]
RNj	ANa	Scaled average value related to O_2 at any time
RR	AR	Average raw value [3]
RT	AT	Average value trend [4]
RV	AV	Validated average value
RVj	AVa	Validated average value related to O_2 at any time
RW	STA	Average value
S	F	Malfunction
SAG	SSR	Sulfur separation rate
SEG	SER	Sulfur emission rate

DE	EN	Significance
t	t	Average time [5]
TM	DM	Daily amount
TMG	DML	Daily amount limit value
TG	DL	Daily limit
TN	DN	Scaled daily value
TT	DT	Daily value trend [4]
TV	DV	Validated daily value
TW	DA	Daily value
W	M	Maintenance

[1] Other common abbreviation: ELV (Emission Limit Value).
[2] Only used when an IED Directive is selected in the evaluation configuration.
[3] *In BEP/SKK:* "Short-term average (STA)".
[4] Extrapolation/forecast
[5] *In BEP/SKK:* "Averaging time".

Characters in formulas, see "Formula operators", page 68

2 Basics of the evaluation

2.1 Configurable Directives

2.1.1 International Directives

Designation	Version
Industrial Emissions Directive (**IED**) = Directive 2010/75/EU of the European Parliament and the Council dated 24th November 2010 concerning industrial emissions	2010-11

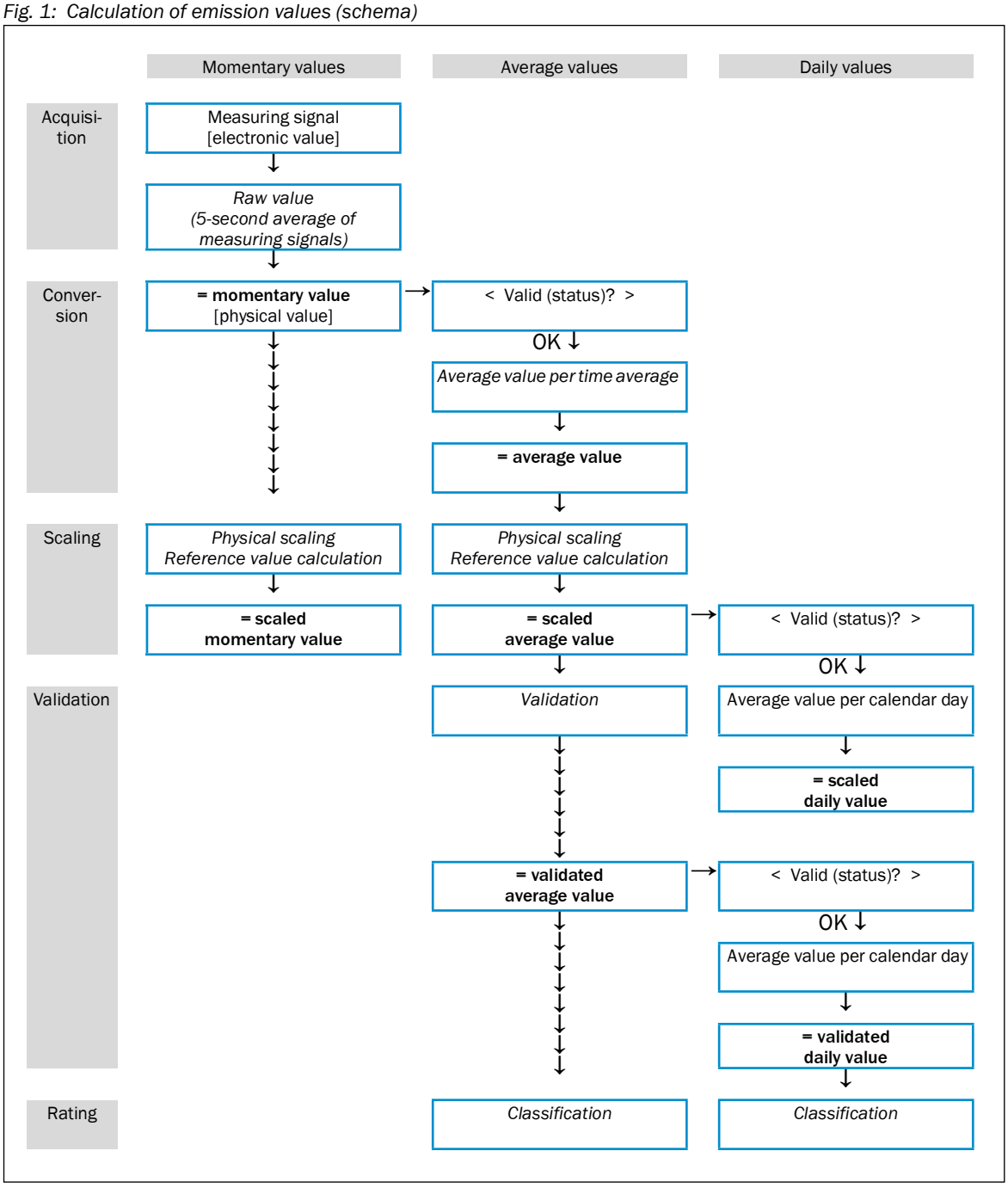
2.1.2 German Directives and Regulations

Designation	Version
Federal Uniform Practice in Monitoring emissions (**BEP**) – Directives of the Federal Ministry for the Environment, Nature Conservation, Construction and Reactor Safety (Germany)	2017-01
Continuous emission monitoring - status identification and classification (**SKK** – practice-oriented presentation of the " Federal Uniform Practice in Monitoring Emissions") – Saxonian State Office for Environment, Agriculture and Geology (Germany)	2019-04
1st BImSchV (Federal Immission Control Ordinance)	2015-08
2nd BImSchV	2013-05
13th BImSchV	2021-07
17th BImSchV	2013-05
27th BImSchV	2013-05
30th BImSchV	2009-04
31st BImSchV	2015-08
First General Administrative Regulation on the Federal Immission Control Act (Technical Instructions for keeping the air clean – **TI Air**)	2002-07
Power Plant Identification System (**UPI**) (Germany)	–

Designation	Version
DIN EN 14181 "Emissions from Stationary Sources – Quality Assurance for Automatic Measuring Equipment"	2015-02

2.2 Calculation of emission values

Fig. 1: Calculation of emission values (schema)



2.3 Calculation principles

2.3.1 Current emission values

Raw values

A MEAC system continuously records the current plant measuring signals. One average value is calculated in 5 second intervals. This value is referred to as “raw value”.

MEAC data acquisition units calculate the raw values automatically (from 10 analog measuring signals per second) and send these raw values to the emission PC. The raw values are calculated in MEAC300 when Field modules are used instead.

Momentary values

In MEAC300, the raw values are converted into physical values immediately (using the configured conversion formula – see “Configuring component acquisition”, page 39). These physical measured values are referred to as “momentary values” in the MEAC system. In MEAC300, the momentary values are used as the current emission values.

Automatic rating of current emission values

Criterion	Result
The measured value source signals status “Malfunction”, “Maintenance” or “Adjustment” for the raw value.	– The momentary value is marked as “invalid”. – *Exception for evaluation according to IED:* A default value is used as the momentary value when configured. This momentary value is marked as “valid”.
The raw value is lower than the lower plausibility value (see “Configuring component acquisition”, page 39).	
The raw value is greater than the upper plausibility value.	– The upper plausibility value is used to calculate the momentary value.
The measured value source signals status “Check Cycle” for the raw value. [1]	– The previous momentary value is used as default value for the current emission value. – The current emission value (momentary value) is set to “0” when the previous momentary value was invalid.

[1] “Check Cycle” is a shortened Check procedure. “Check Cycle” is irrelevant for German Directives.

Classification of the current emission values

- A momentary value is “valid” (i.e. it can be used as emission value) when status signal “Malfunction”, “Maintenance” or “Calibration” was not activated for the respective measuring component at the end of the 5-second interval and when the raw value is not lower than the lower plausibility value.
- A momentary value is “subject to compliance” when status signal “compliance operation” was activated and an operating mode marked as “subject to compliance” was active (see “Plant: BEP evaluation settings, Part 2 (example)”, page 36).

Momentary values automatically assume the status information of the raw values from which they were calculated.

Classification of emission values, see “Classification of emission values”, page 19.

2.3.2 Scaling and reference value calculation

If necessary, the momentary values are automatically converted to physical standard conditions (1013 mbar / 0 °C / 0% moisture). The O_2 reference value calculation for pollutants can also be carried out. The evaluation configuration must consider the analyzer operating conditions and its own scaling factors.

Individual conversions (e.g. O_2 reference value calculation for various fuels) are possible using formulas (see “Programming formulas”, page 66).

Scaling is not used for the momentary values but just for the average values for BEP evaluations.

2.3.3 Average values, average time

Equivalent designations in German Directives (BEP):
- Average value = “Short-term average” = “Half-hour average value (HAW)”[1]
- Average time = “Averaging time for short-term mean values”

[1] For average time = 30 minutes.

Calculation rules

An average value is the average of the momentary values within the average time. The average time is normally specified by the relevant official Directive (setting see “Configuring component acquisition”, page 39).

Average values are basically calculated from unscaled momentary values. The average values must be scaled for the evaluation (see “Configuring status signals, reference value calculation and scaling”, page 42). When an IED Directive is selected in the evaluation configuration (see “Setting IED evaluation parameters”, page 37), the average values can also be calculated from the scaled momentary values.

Adjustable average times: 3/10/20/30/60/120/240/480 minutes.

Evaluation rules

- When the average time had sufficient momentary values that were both valid and subject to compliance, the average value is calculated from these momentary values and marked “valid”. The minimum proportion of the momentary values can be configured (see “Setting BEP evaluation parameters”, page 35).

  Minimum proportion of momentary values during BEP evaluations: Two thirds (two thirds criterion).

- If the minimum proportions of momentary values is not reached, the average value is marked “invalid” and calculated from all momentary values that were valid and for which status signal “compliance operation” was activated.
- If status signal “compliance operation” was not activated during the complete average time, the average value is calculated from all valid momentary values.

The average value timestamp is generated when the average value is calculated (i.e. at the end of the average time).

2.3.4 Validation

The emission value validation serves to consider the measurement uncertainty of the measuring device calibration. The “standard deviation” of the measuring device calibration is subtracted from the emission value here.

Validation takes place after physical scaling.

- When the result of the subtraction is negative, value ”0” is used for the validated average value.
- When different operating conditions are taken into account for the evaluation of emission data (e.g incinerators), the average of the relevant standard deviations is used.

2.3.5 Long-term mean values

2.3.5.1 *Daily values*

Types of daily values

- A daily value is the average value of the valid average values of the relevant day.
- The scaled daily value is the average value of the valid average values of the day.
- The validated daily value is the average value of the valid validated average values of the day.

Minimum number of average values

- The daily value is marked “invalid” when the minimum number of valid average values has not been reached during the day *(using BEP evaluation: 25%)*.
- *For IED/13th BImSchV:* The daily value is marked “Availability not maintained” when more than 5 (IED Waste) or 6 (IED Power, 13th BImSchV) average values subject to compliance were invalid due to status “Malfunction/Maintenance” during the day.

Using BEP evaluation:
An average value is subject to compliance when at least two thirds of the momentary values used for the calculation are subject to compliance.

2.3.5.2 *Monthly values*

- The monthly value is the average of the valid validated average values in a month.
- The monthly is marked “invalid” when the minimum number of valid average values has not been reached *(using BEP evaluation: 25%)*.

- Criterion for valid long-term average values, see “Setting BEP evaluation parameters”, page 35.
- Criterion for valid average values, see “Average values, average time”, page 13.

2.3.5.3 *Rolling monthly values acc. to 13th BImSchV (Germany)*

The 13th BImSchV stipulates: "Rolling monthly values" for NO_x emission must be monitored in existing refineries.

The rolling monthly value is the arithmetic average value of the valid validated average values from the last 30 days. The 30 day interval shifts daily by one day.

The rolling monthly value is marked "valid" when at least 25% of the average values within the rolling period were valid relative to the fixed total count of 30 x 48 average values

- When the evaluation is restarted, the first valid rolling monthly value will be available after 8 days at the earliest.
- The "Availability" criterion is not monitored for rolling monthly values.

2.3.5.4 *Yearly values in accordance with 17th BImSchV*

For plants to which the 17th BImSchV directive applies, the annual value is to be calculated as the arithmetic average value of the valid daily values (BEP).

All daily values of the current calendar year assigned to classes T1 ... T10 and TS1 are used (see "Classifying daily values", page 22). The yearly value is marked "invalid" when less than 25% of the daily values are in this class during the calendar year.

2.3.5.5 *Yearly values in accordance with 13th BImSchV*

For plants to which the 13th BImSchV directive from 07-2021 applies, the annual value is to be calculated as the arithmetic average value of the valid daily values (BEP).

All daily values of the current calendar year assigned to classes M1 ... M20 and S1 are used (see "Average value classification", page 20).

The yearly value is marked "invalid" when less than 25% of the daily values are in this class during the calendar year.

For the calculation of the annual value, the valid average values must always be converted to the O_2 reference value and validated. I.e. the conversion takes place even if the O_2 measured value is smaller than the O_2 reference value.

As a result, it is possible that average values that are assigned to class S14 (GW exceeding in startup/departure operation) after application of the original O_2 reference value calculation are nevertheless used for the annual value calculation. This would be the case when the average value no longer exceeds the average limit due to the O_2 reference value calculation applied at any time.

- The yearly values of the past 5 calendar years, including the amount of valid daily values and the yearly limit used as basis, are stated as amount per unit volume in a daily protocol.
- The yearly protocol also contains the yearly values of the past 5 calendar years.

2.3.6 Trend values

Average value trend

The average value trend is a forecast for the average value of the current average time.

Calculation formula: $RT = [(R_X \cdot N_{MR-G}) + (MR_X \cdot N_{MR-R})] / (N_{MR-G} + N_{MR-R})$	
RT	Average value trend
R_X	Preliminary average value for the current average time
N_{MR-G}	Number of momentary values that are valid and subject to compliance in the current average time
MR_X	Valid and subject to compliance momentary value in the current average time
N_{MR-R}	Remaining number of momentary values up to the end of the current average time

Daily value trend

The daily value trend is a forecast for the daily value for the current day.

Calculation formula: $TT = [(T_X \cdot N_{R-G}) + (RT \cdot N_{R-R})] / (N_{R-G} + N_{R-R})$	
TT	Daily value trend
T_X	Current preliminary daily value
N_{R-G}	Number of valid average values up until now during the current day
RT	Average value trend *(see above)*
N_{R-R}	Remaining number of average values for the current day

2.3.7 Emission loads (amounts)

Emission loads are calculated as mathematical product of the average values for the emission concentration (non-validated) and the flue gas volume flow. These mean values are calculated from all valid momentary values created during the average time while status signal “compliance operation ” was activated. The proportion of these momentary values within the average time is considered in the result. The scaling (standard conditions, O_2 reference value calculation) of both average values must be identical.

Physical calculation formula: $STE = RRa_C^{[1]} \cdot RRa_V^{[1]} \cdot t \cdot (N_{MR-B} / N_{MR})$	
STE	Short term emission (Short Term Emission)
RRa_C	*For the emission components:* Average value of all valid and non-scaled momentary values created during the average time, while status signal “compliance operation” was activated
RRa_V	As RNa_C, but for the flue gas volume flow
t	Average time
N_{MR-B}	Number of momentary values created during an average time while status signal “compliance operation” was activated
N_{MR}	Maximum number of momentary values in the average time.

[1] Configurable (for adaption to scaling/O_2 reference value calculation and default value)..

A default value must be used instead of the mean values when there are no valid momentary value within an average time. The calculation formula must be configured so that this case is considered with suitable default values.

Emission loads for longer time periods are calculated as total of the individual emission volumes in the respective time period.

2.4 Classification

2.4.1 Classification of emission values

The calculated emission data are assigned to classes defined in the selected Directive or regulation. The individual emission data are counted in the class with the respective criteria. Possible criteria:

- Emission value size
- Operating conditions and status signals while the emission value is generated.

The classified data can be output as Value list or frequency distribution.

Emission data which can be classified:	• Average values • Daily values
Classifiable time intervals:	• Days • Months • Years

- Observed Directives, see “Configurable Directives”, page 10.
- Directive or regulation selection
  - see “Setting BEP evaluation parameters”, page 35
  - see “Setting IED evaluation parameters”, page 37
- Further information on classification
  - see “Average value classification”, page 20;
  - see “Valid calibration range”, page 21.

2.4.2 Average value classification

Class lists and detailed descriptions for average values, see “Standard classes for average values”, page 83.

Classification rules for numerical rating of average values

- Only valid, validated average values are classified.
- Unvalidated, scaled average values are used for monitoring the “valid calibration range” (see “Valid calibration range”, page 21).
- Before being compared against the average limit, the average value is rounded to the number of decimal places of the average limit.

M classes

Average values lower than the average limit and valid are counted in the M classes.

Each M class represents a section of the value range between “zero” and the average limit. This value range is split in 20 equidistant sections. These class sections are referred to as “M1” to “M20”.

For the grading in an M class, the average value is first rounded to the number of decimal places of the upper class limit.

S classes (special classes) for numerical rating

Average values greater than the average limit are counted in classes S1, S14, S16 and S17.

- All average values for which at least one momentary value was created while status signal “compliance operation” was activated are counted in class S6.
- The classification rules for the other classes are specified in SIC annex 4/5.

- Average values can also be output without automatic rounding.
- Classes for average values, see “Standard classes for average values”, page 83.

2.4.3 Valid calibration range

Purpose

The “valid calibration range” is the physical value range in which the average values of a component are considered, metrologically, as reliable (EN 14181). Valid average values outside the “valid calibration range” are counted specifically (class S9 and S10).

General functions

- The start value of a “valid calibration range” is always “0”.
- The end value of the “valid calibration range” is determined using the current physical calibration of the relevant analyzer (e.g. using the Calibration report) and then entered manually in the MEAC program.
- Classifications based on the “valid calibration range” always start anew automatically when the “valid calibration range” has been changed or confirmed.
- The “valid calibration range” is used for non-validated, scaled average values.

Time base for the rating (configurable)

- *Time base for plants with continuous operation:* Total number of average values created during the last calendar week while status signal “compliance operation” was active (= number of average values in class S6).
- *Time basis for plants with intermittent operation:* The last 168 hours in total in which status signal “compliance operation” was active (also with interruptions).

Configuration functions for “valid calibration range”, see “Configuring component acquisition”, page 39.

Rating average values

- Average values, which are valid but not in the “valid calibration range”, are counted in class S9 (see “Standard classes”, page 83).
- At the end of each calendar week (Sunday 24:00), the size of the share of these average values (class S9) in relation to the configured time basis is calculated. This share is rated:
  - When more than 5% of the average values were greater than the “valid calibration range” within the time basis, the value of class S10 is increased by 1 on the following Monday.
  - When more than 40% of the average values were greater, the value of class S10 is increased by 6 on the following Monday.
  - *For time basis = 168 hours (intermittent):* When class S10 has been increased and status signal “compliance operation” was not activated continuously during the following calendar week, the class S10 is not increased after this following week. This also applicable for all further following calendar weeks in which status signal “compliance operation” is not activated continuously.
- When the value of class S10 is greater than 5, a message is created, which shows that the relevant analyzer has to be calibrated.

Each increase of classes S9 and S10 is also counted in the event summary.

Clearing meter levels

▶ *To set classes S9 and S10 to zero again:* Activate or modify the calibration range (see “Configuring component acquisition”, page 39).

Class S9 is cleared automatically every Sunday at 24:00.

2.4.4 Classifying daily values

List of classes for daily values, see “Standard classes for daily values”, page 84.

The daily values of all emission components are calculated and then classified daily at 24:00.

Criterion	Effect
The number of average values valid on this day is too low.	• The daily value is calculated as soon as at least one valid average value is present for the day. • The event is counted in class TS2.
The daily value is not greater than the daily limit.	• The daily value is counted in one of the classes T1 to T10, according to the relation “Daily value/daily limit”.
The daily value is greater than the daily limit.	• The daily value is counted in class TS1.

Only for BEP evaluations:	
Criterion	Effect
The number of average values counted during the day in the classes “Malfunction of analysis measuring system” or “Maintenance of analysis measuring system” is greater than allowed (5 or 6).	• Additionally, the daily value is counted in class TS3.
The average value is classified in special class S1 or special class S17.	• This average value is considered when calculating the daily value (is included in the daily value).
The average value is classified in special class S17.	• This average value is not considered for the daily value.

Only for daily values of the sulfur separation rate acc. to BEP:	
Criterion	Effect
The daily value is not greater than the daily limit.	• The daily value is counted in class TS5.
The daily value is greater than the daily limit.	• The daily value is counted in class TS4.
Count daily value in the classes T1 ... T10 and TS.	*Not required.*

2.5 Evaluation structures in MEAC300

2.5.1 Structuring unit “Plant”

Purpose of a “plant”

In MEAC300, a “plant” is a virtual unit in which the evaluation of emission data of a certain real emission source is organized. The selected evaluation guideline of a virtual plant is an essential property.

The virtual plant comprises all parameters relevant for the evaluation guideline:

- Measured values of all emission components
- Operating states of the real plant
- Parameters for fuel feeding and flue gas purification

The selected evaluation guideline determines the necessary and possible settings of the evaluation configuration. This affects all objects which are part of a plant and influences their configuration options.

Effectivity of a “plant” in IED evaluations

Monitoring the average values of all components (see “Functions for a “component” in the evaluation”, page 24) (see “Structuring unit “Component””, page 24) has the following consequences:

- For each “monitored” component, all average times within one calendar year in which the average values were greater than the average limit are totalled. A corresponding event message for the plant is generated when the total of these average times exceeds the relevant limit value of the plant.
- An event message for the plant is generated automatically when the average values of a “monitored” component are greater than the relevant average limit without interruption and the duration of this state exceeds the relevant limit value.

Output of this event	
– in “Current” screens	▶ see “Operating Instructions MEAC300”
– via digital outputs:	▶ see “Configuring digital outputs”, page 70
– via numeric outputs:	▶ see “Configuring numeric outputs”, page 72
– in reports:	▶ see “Technical Information MEAC300-Add-ons” → “MEx300”

- ▶ Activating monitoring a component, see “Configuring classifications for the 17th BImSchV/IED Waste/FNADE”, page 48.
- ▶ Setting limit values for monitoring, see “Setting BEP evaluation parameters”, page 35.

2.5.2 Structuring unit “Component”

Purpose of a “component”

In MEAC300, a “component” represents the real emission values from a certain data source. The conversion into the physical value is defined in the configuration of a “component”. Apart from that, a “component” contains the status signals of the real measuring system, i.e. the basic information for evaluating the individual emission values. All emission data of a component are permanently saved with their timestamp.

It is possible to set up several “components” which use the same data source. The “virtual components” represent the same emission value, but can be evaluated differently. With this method, real emission values can be taken into account differently and several times during evaluation.

Formulas can be used for the physical conversion (see “Programming formulas”, page 66).

Functions for a “component” in the evaluation

- The average values of each component can be monitored individually by defining an average limit per component. This affects the messages of the “plant” to which the component belongs (see “Structuring unit “Plant””, page 23).
- A corresponding message is generated when the number of average values invalid within one day is greater than the limit value configured for this plant.
- A corresponding message is generated when the number of daily values invalid within one calendar year is greater than the limit value configured for this plant.

2.5.3 Structuring unit “Analyzer” (IED)

– Only valid for IED evaluations –

Purpose of an “analyzer”

In MEAC300, an “analyzer” is a virtual unit used to monitor the availability of a real measuring device. Invalid average values are counted; their number must not exceed a certain limit value.

Depending on the type, real measuring devices can measure one or several measuring variables. As several components can be configured for one emission value (see “Structuring unit “Component””), those components which should represent the measured variables of the real device have to be selected.

Average value counter for an “analyzer”

The following are counted for all “components” of a virtual analyzer:

– The number of average values invalid within a calendar year.
– When a current average value was invalid: The number of average values invalid without interruption up to this point.

A message is generated automatically when the number is greater than the associated limit value (individually configurable).

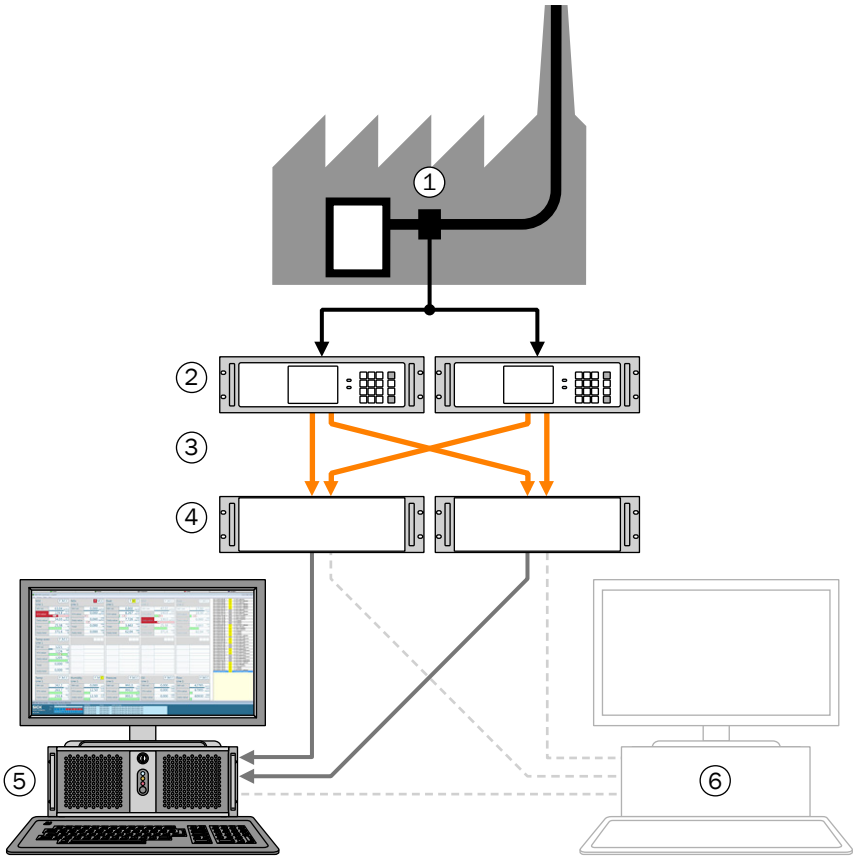
2.5.4 Redundant signal sources

Example for redundant signal sources

- Each emission component is measured with two separate analyzers.
- The measured value of each analyzer is transferred via two signal paths (e.g. via two data acquisition units), which can be used alternatively.

This means 4 alternative signal sources for each emission component (see “Emission measuring system with redundant signal sources (example, schematic)”).

Fig. 2: Emission measuring system with redundant signal sources (example, schematic)



1 Measuring point of emission component
2 Redundant analyzers
3 Redundant signal sources
4 Redundant data acquisition units
5 Emission PC
6 Redundant Emission PC[1]

[1] Information on systems with redundant emission PCs, see “Technical Information MEAC300 Add-ons”.

Adapted evaluation

The emission data evaluation can be adapted to automatically to take redundant signal sources into account:

- see “Configuring component acquisition”, page 39.
- see “Mode for redundant signal sources”, page 40.

3 Configuring the system

3.1 Configuring the evaluation: Overview

Activate Configuration mode:	▶ Start Simulation mode.	see “Using Simulation mode for configuration (principle)”, page 27
If desired: Use an existing evaluation configuration.	▶ Load a saved evaluation configuration.	
Configure the MEAC system:	1 Define the name.	see “Defining a name for the MEAC system”, page 31
	2 Configure the communication paths.	see “Configuring communication paths”, page 31
	3 Configure the interfaces and hardware inputs.	see “Configuring interface and hardware inputs”, page 32
	4 *If required:* Set up virtual analyzers.	see “Creating virtual analyzers (IED)”, page 33
Set evaluation parameters:	1 Configure at least one plant.	see “Configuring a plant”, page 34
	2 Configure all components.	see “Configuring a component”, page 38
	3 Configure the counters.	see “Configuring the counters”, page 61
	4 Define the internal status.	see “Defining internal statuses”, page 64
	5 *If required:* Define the constants.	see “Defining constants (if required)”, page 65
	6 *If required:* Program the formulas.	see “Programming formulas”, page 66
	7 *If required:* Configure the digital outputs.	see “Configuring digital outputs”, page 70
	8 *If required:* Configure the numeric outputs.	see “Configuring numeric outputs”, page 72
Check the evaluation configuration in Simulation mode:	1 Start the test run.	see “Testing the simulated evaluation configuration”, page 75
	2 Vary the test parameters.	
	3 Assess the simulated results.	
After successful test: Use the tested evaluation configuration as real evaluation.	1 Terminate Simulation mode.	see “Testing the simulated evaluation configuration”, page 75
	2 Activate the evaluation configuration.	see “Activating the simulated evaluation configuration”, page 75

3.2 Using Simulation mode for configuration (principle)

Instructions for the operating functions in Simulation mode, see “Operating Instructions MEAC300”.

Step 1: Start Simulation mode

1 Execute login with suitable user.
2 Select Simulation.
››› The toolbar shows the functions for Simulation mode (see “Basic functions in Simulation mode (overview)”, page 28).

Step 2: Create a simulated evaluation configuration

1 Select Configuration.
2 Set the simulated evaluation configuration (see “Configuring the MEAC system”, page 31).

In older MEAC documents, the evaluation configuration is also referred to as “data model”.

Step 3: Test the simulated evaluation configuration

1 Make a test run and check the test results (Instructions, see “Operating Instructions MEAC300”).

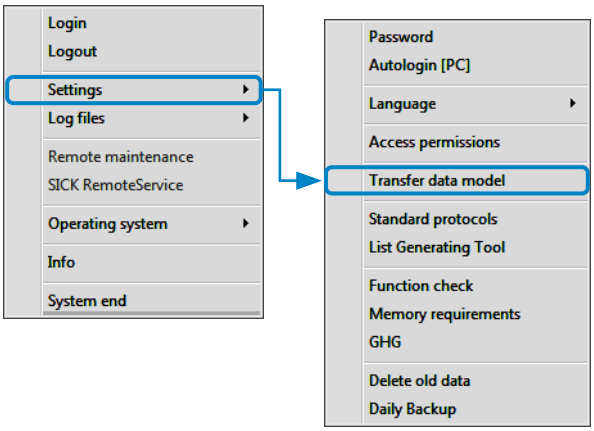
When the evaluation configuration has been changed, the test run must be terminated and started again so that the changed evaluation configuration is effective during the test run.

When the test was successful:

Step 4: Use the tested evaluation configuration

1 Terminate Simulation mode (Stop function in system window).
2 Activate the simulated evaluation configuration for the real evaluation (see “Using the evaluation configuration”).

Fig. 3: System Using the evaluation configuration



3.3 Basic functions in Simulation mode (overview)

Button	Function (Simulation mode)
Current	Display the simulated “current” emission data.
Review	Display the simulated “previous” emission data.
Configuration	Display the simulated evaluation configuration.
Start	Start the test of the simulated evaluation configuration.
Settings	Set the simulation conditions. [1]
Main program	Terminate Simulation mode.

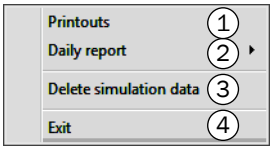
[1] e.g. measured values, status, time sequence.

- The red functions do not affect real evaluation.
- The real evaluation continues to run in Simulation mode.

3.4 Help functions for the simulation

▶ Select Settings.

Fig. 4: Settings Help functions of the simulation



1	▸ Configure the printouts of simulated data.
2	▸ Print or export the simulated daily protocol.
3	▸ Delete all simulated results. [1]
4	▸ Terminate Simulation mode.

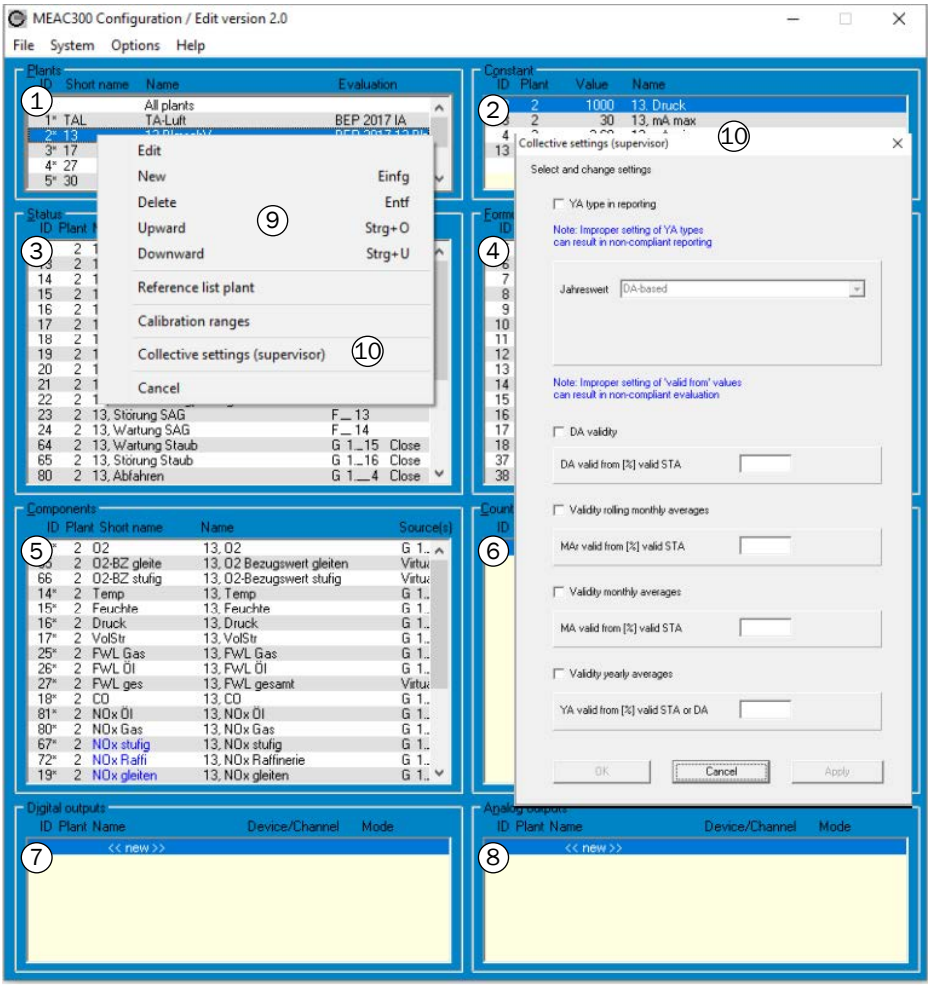
[1] Use when the evaluation configuration was changed or to attain completely new simulated results.

3.5 Functions of the evaluation configuration (overview)

▶ Select Configuration.
»» The set simulated evaluation configuration is displayed (see “in Simulation mode – main window (example)”).

3.5.1 Contents of the configuration window

Fig. 5: Configuration in Simulation mode – main window (example)

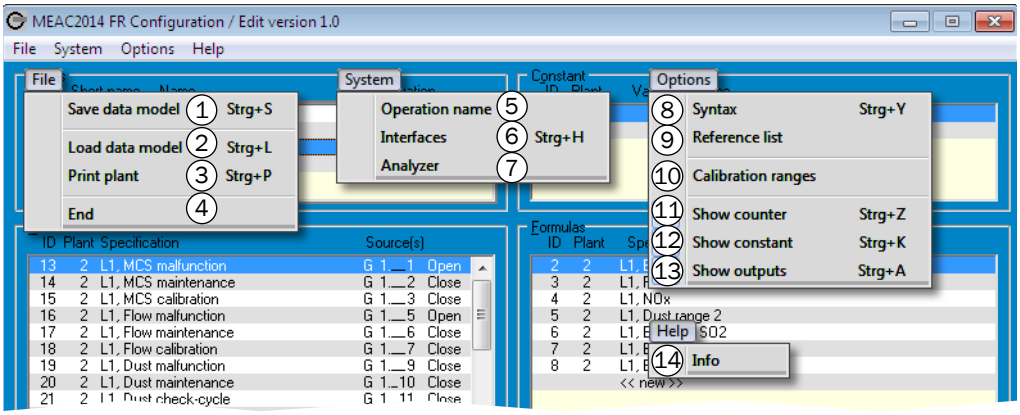


1	▶ Configure the plants. [1]	see “Configuring a plant”, page 34
2	▶ Define the constants. [1][2][3]	see “Defining constants (if required)”, page 65
3	▶ Configure the status processing. [1][2]	see “Defining internal statuses”, page 64
4	▶ Configure the formulas. [1][2]	see “Programming formulas”, page 66
5	▶ Configure the components (emission values). [1][2]	see “Configuring a component”, page 38
6	▶ Configure the counters. [1][2][3]	see “Configuring the counters”, page 61
7	▶ Configure the digital outputs. [1][2][3]	see “Configuring digital outputs”, page 70
8	▶ Configure the numeric outputs. [1][2][3]	see “Configuring numeric outputs”, page 72
9	▶ Context menu (example) [4]	
10	▶ Make collective settings for a plant. [5]	see “Configuring a plant”, page 34

[1] *To configure an entry:* Doubleclick the respective line. Or call up the context menu and select the edit function there.
[2] When an individual plant is highlighted, the list only shows entries which belong to this plant.
[3] Only available when the relevant display option is activated.
[4] *To open the context menu:* Right click on a line in the list.
[5] Note: Improper setting of the annual value type and LTA valid-from values may result in a non-compliant evaluation. (LTA: long-term averages)

3.5.2 Menu functions in the configuration window

Fig. 6: Configuration *in Simulation mode – menu functions*



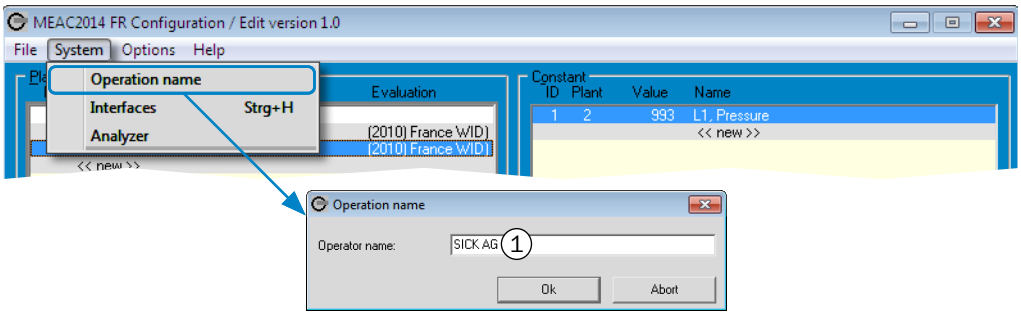
1	▸ Save the displayed evaluation configuration (data model). [1]	
2	▸ Load the current real evaluation configuration or a saved real evaluation configuration. *IMPORTANT:* The displayed evaluation configuration is then discarded. [2]	
3	▸ Output the part of the evaluation configuration displayed on a printer. [3]	
4	▸ Close the evaluation configuration.	
5	▸ Define a name for the MEAC system.	see “Defining a name for the MEAC system”, page 31
6	▸ Integrate data acquisition devices and output devices.	see “Configuring communication paths”, page 31
7	▸ Name the analyzers.	see “Creating virtual analyzers (IED)”, page 33
8	▸ View errors (inconsistencies) of the evaluation configuration.	
9	▸ View dependency structures of the evaluation configuration. [4]	
10	▸ View “valid calibration ranges”.	see “Valid calibration range”, page 21
11	▸ Show the counters.	see “Configuring the counters”, page 61
12	▸ Show the constants.	see “Defining constants (if required)”, page 65
13	▸ Show the hardware outputs.	see “Configuring hardware outputs”, page 70
14	▸ Retrieve information on the MEAC program.	

[1] Does NOT activate this evaluation configuration for the real evaluation.
[2] *Recommendation:* Save the displayed evaluation configuration beforehand.
[3] The values to be included in the output are adjustable. Preview on the PC monitor is selectable.
[4] Tree structure for statuses, formulas and components.

3.6 Configuring the MEAC system

3.6.1 Defining a name for the MEAC system

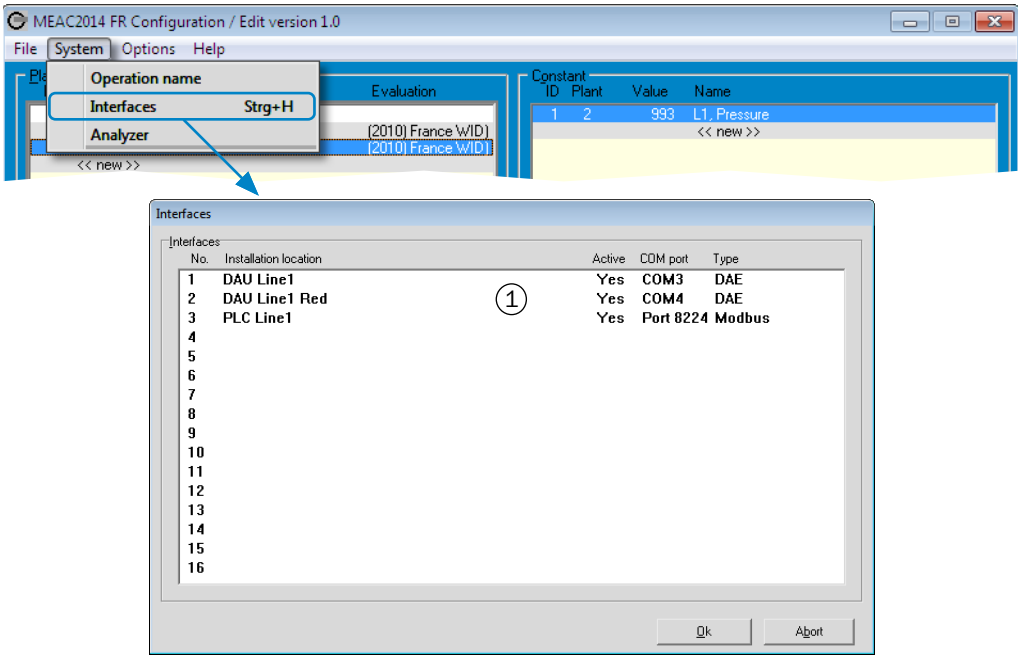
Fig. 7: Configuration System name



1	▸ Enter the desired name of the MEAC system.

3.6.2 Configuring communication paths

Fig. 8: Configuration List of communication paths



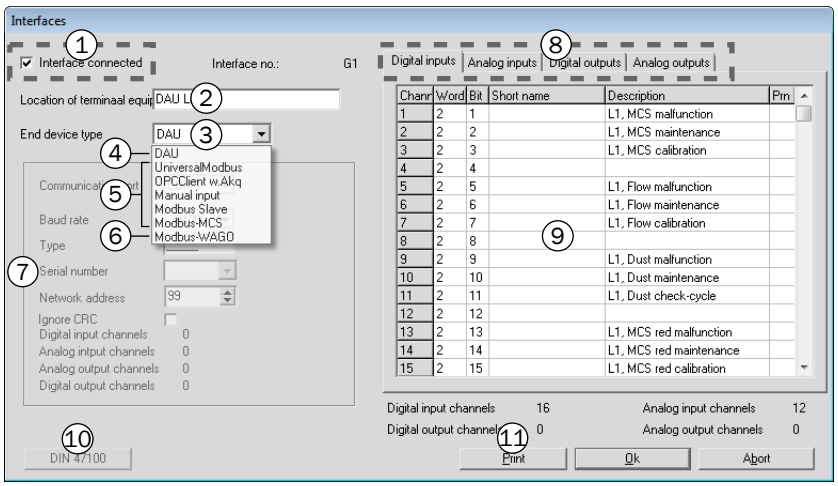
1	Configured communication paths (interfaces to data acquisition devices and output devices or software interfaces for data communication). ▸ *To change existing settings:* Doubleclick the respective line. ▸ *To configure a new interface:* Doubleclick an empty line.

Further information, see “Configuring interface and hardware inputs”, page 32

3.6.3 Configuring interface and hardware inputs

▶ Select a device from the list of connected devices (see “Configuring communication paths”, page 31).

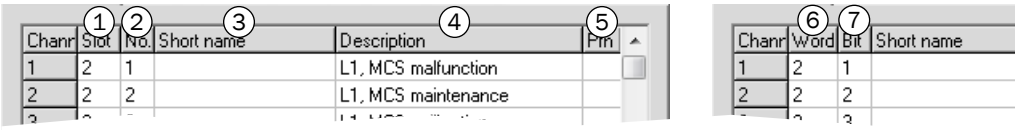
Fig. 9: Configuration *Configuring interfaces and signal connections*



1	▶ Activate the interface / activate the data of this device for evaluation.
2	▶ Enter MEAC-internal identification of the device. [1]
3	▶ Select the type of the connected device.
4	MEAC data acquisition unit (hardware option) [2]
5	MEAC300 Add-on (software option) [2]
6	Field module
7	▶ Configure the interfaces to the device. [3]
8	▶ Select the type of the signal connections.
9	▶ Configure the signal connections (see “Configuring individual signal connections”).
10	▶ Print the color code for 37-pole connection cable. [4]
11	▶ Output the settings of the displayed interface on a connected printer.

[1] *Recommendation:* Select a name which contains the location and/or the plant.
[2] See “Technical Information MEAC300 Add-ons” (separate document).
[3] The selection options and settings depend on the type of the connected device.
[4] In accordance with DIN 47100. Suitable for the delivered connection cables of the MEAC data acquisition units.

Fig. 10: Configuring individual signal connections



Type of connected device = MEAC data acquisition unit:	
1	▶ Enter the number of the electronic board which contains the signal connection.
2	▶ Enter the number of the signal connection on the electronic board (channel number).
3	▶ *If required:* Enter the UPI name for the signal connection.
4	▶ Enter MEAC-internal identification of the signal connection.
5	▶ *Only for digital connections:* Enter “X” when each status change of the signal connection should appear in the printed protocol.

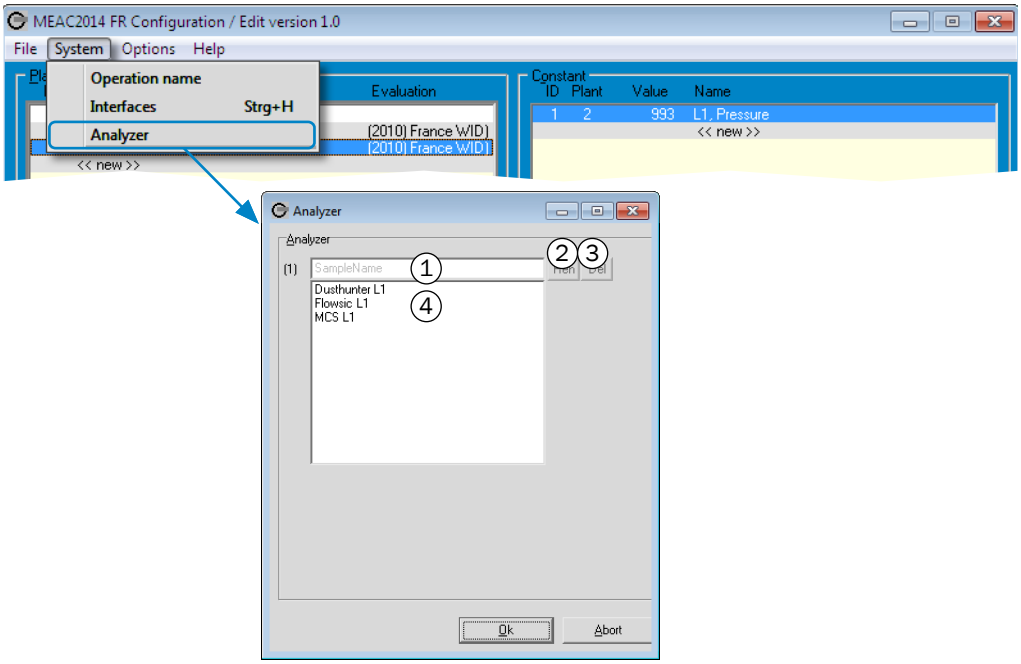
Type of connected device = MEAC300 Add-on:	
6	▶ Determine the word within a Modbus data package which contains the Status bit.
7	▶ Enter the bit within this word which is the desired Status bit.

3.6.4 Creating virtual analyzers (IED)

– Only valid for IED evaluations –

If required, the desired virtual analyzers can be created with this function (explanation, see “Structuring unit “Analyzer” (IED)”, page 24). A virtual analyzer can be assigned to a component (see “Assigning the component to a virtual analyzer (IED)”, page 59).

Fig. 11: Configuration *Analyzers*



1	*To name a new analyzer:* 1 Enter the name of the analyzer in this field. 2 Press the Enter key.
2	*To change the name of an analyzer:* 1 Mark the respective analyzer in the list of analyzers. 2 Click this button.
3	*To delete an analyzer from this list:* 1 Mark the respective analyzer in the list of analyzers. 2 Click this button.
4	List of named analyzers in the MEAC system

3.7 Configuring a plant

▶ *Carry out these procedures for all plants which should be defined.*

Purpose and effect of a “plant”, see “Structuring unit “Plant””, page 23.

3.7.1 Adding/deleting a plant

To set up a new plant in the evaluation configuration:	▶ Doubleclick on the empty entry in the list of plants.
To delete an existing plant from the evaluation configuration:	1 Highlight (click) the respective plant in the list of plants. 2 Use the Delete function (keyboard or context menu).

3.7.2 Naming the plant

Fig. 12: Configuration Plant – identification

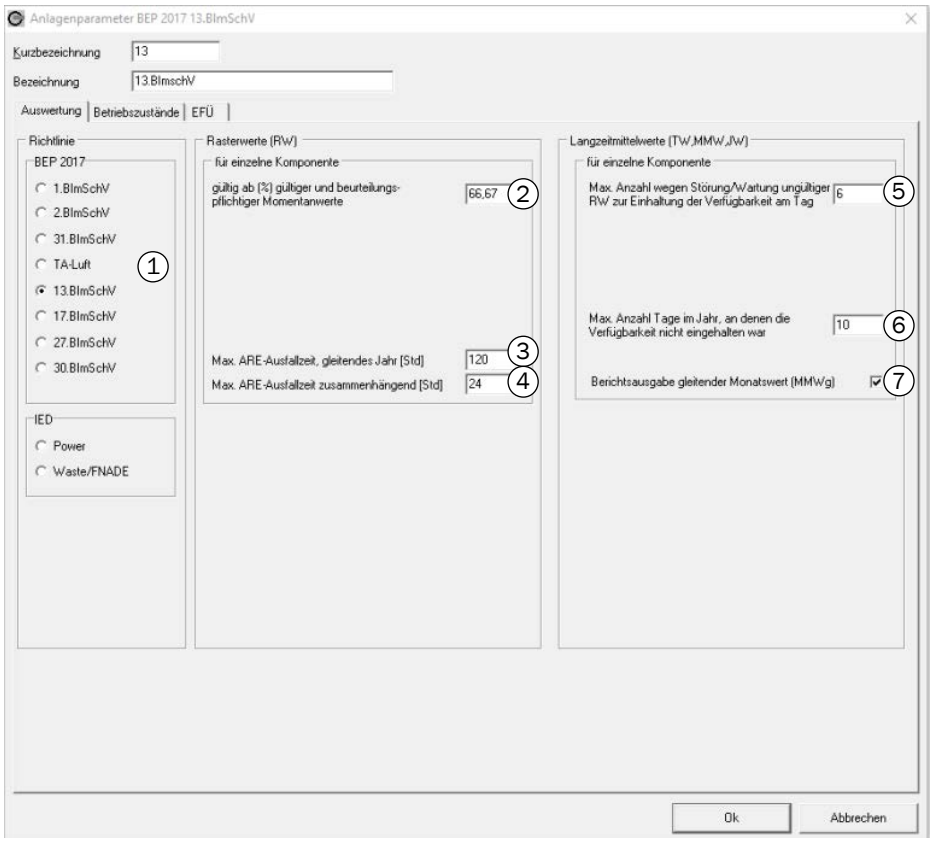
1	▶ Enter a short name for this plant. [1]
2	▶ Enter an identification for this plant.

[1] Used in graphic displays.

3.7.3 Setting BEP evaluation parameters

– Only valid for Germany –

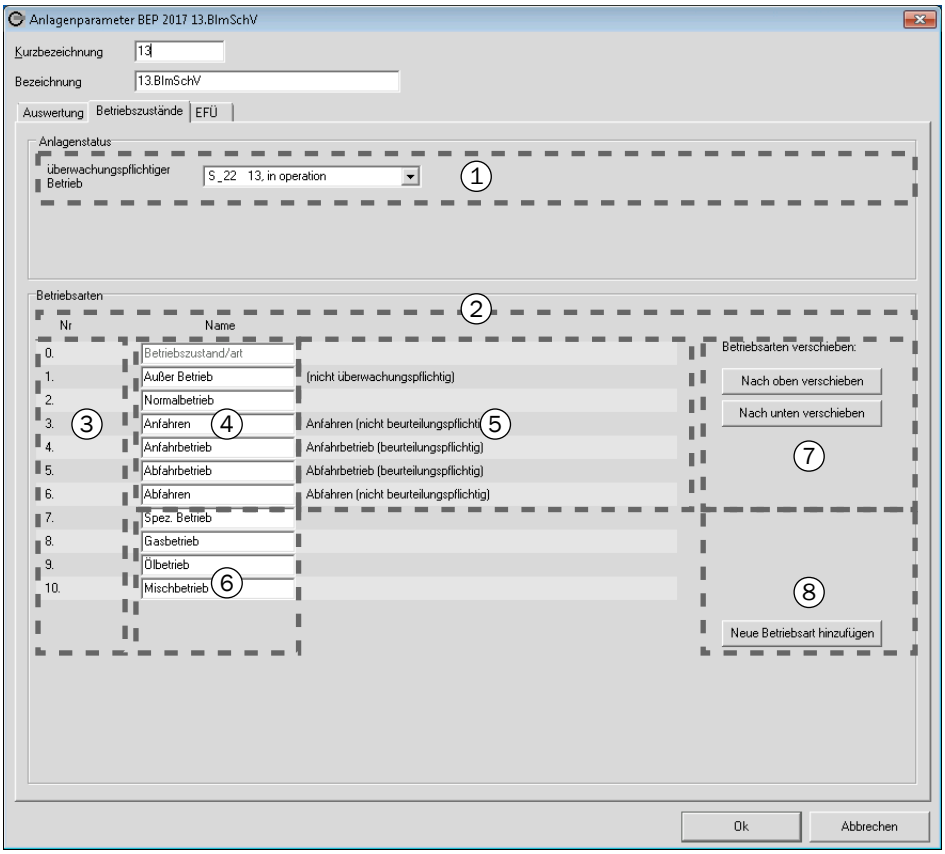
Fig. 13: Configuration *Plant: BEP evaluation settings, Part 1 (example)*



1	▸ Select the guideline for evaluating the emission data acc. to BEP. [1]
2	▸ Enter the share of momentary values that are both valid and subject to rating that must be within an average time so that the average value is valid. [2]
3	▸ Enter for how many hours per calendar year *(13. BImSchV: Within the previous 365 days)* status signal “Failure of flue gas purification” is allowed to be activated for a single component before a message is generated for this reason.
4	▸ Enter how many hours status signal “Failure of flue gas purification” of a single component is allowed to be activated without interruption before a message is generated for this reason.
5	▸ Enter how many average values may be invalid per day due to “malfunction” or “maintenance” of the automatic measuring system before the daily value is marked with status “Availability not maintained”.
6	▸ Enter how many daily values per year may be marked with status “Availability not maintained” before a message is generated for this reason. [3]
7	▸ Enable the output of rolling monthly averages, limits and related events in the report for all components of this plant.

[1] The selection defines which evaluation functions are available.
[2] Valid for all plant components. Standard value: 66.67% (two-thirds criterion).
[3] Standard value: 10.

Fig. 14: Configuration *Plant: BEP evaluation settings, Part 2 (example)*



1	▸ *Configure "compliance operation" status signal:* Select the status signal to signal operating state "Plant in compliance operation".
	• This assignment activates emission data evaluation for this plant. • Emission data are only saved but not evaluated when a status signal for "compliance operation" is not configured.
2	Definition of "special operating modes" for this plant [1]
3	Number of the "special operating mode" [2]
4	Default "special operating modes" ▸ *To change a designation:* Change the text. [3]
5	Default evaluation function
6	Individually configured "special operating modes" [4]
7	▸ Shift marked "special operating mode" in the sequence (assign different number). [5]
8	▸ *As required:* Enter the designation for a new individual "special operating mode".

[1] Configuration of individual "special operating modes", see "Configuring the evaluation for special classes and "special operating modes"", page 53.
[2] Defines the priority when several "special operating modes" apply simultaneously. "0" and 1" are fixed.
[3] Not possible for "0".
[4] *To delete a "special operating mode":* Delete the designation.
[5] Not possible for "0" and "1".

Emission data for this plant are only saved but not evaluated when a status signal for plant status "Plant in compliance operation" is not configured.

- Configuring individual "special operating modes", see "Configuring individual "special operating modes"", page 37.
- Configuring the evaluation of "special operating modes" see "Configuring the evaluation for special classes and "special operating modes"", page 53.

3.7.4 Setting IED evaluation parameters

– in preparation –

- "IED Power" evaluations can only be configured with software versions "MEAC300 EP" and MEAC300 EPW".
- "IED Waste" evaluations can only be configured with software version "MEAC300 EPW".

3.7.5 Configuring individual "special operating modes"

- Configuring the set of "special operating modes", see "Plant: BEP evaluation settings, Part 2 (example)", page 36.
- Configuring the evaluation of "special operating modes" see "Configuring the evaluation for special classes and "special operating modes"", page 53.

Purpose

- In MEAC300, the "special operating mode" is an additional, informative status identifier saved automatically with each average value of the plant.
- A "special operating mode" can be derived from logical linking of other statuses and values.

Usage examples:
– Status "shutdown operation", calculated from the individual plant status
– Status "current fuel" for incineration plants, calculated as logical link from the respective plant status

- In MEAC300, 6 individual "special operating modes" can be programmed for each plant.
- The "special operating modes" are valid in a certain sequence (see "Plant: BEP evaluation settings, Part 2 (example)", page 36).

Further status identifiers for average values, see "Status identifiers of average values", page 81.

When no "special operating mode" has been configured for the component, value "0" is saved as status identifier for the "special operating mode".

Procedure to configure a "special operating mode"

1 Program a Boolean formula where the current result is the status of the "special operating mode".
2 Create an individual "special operating mode" (see "Plant: BEP evaluation settings, Part 2 (example)", page 36).
3 Assign the Boolean formula to this "special operating mode" (see "Configuring the evaluation for special classes and "special operating modes"", page 53).

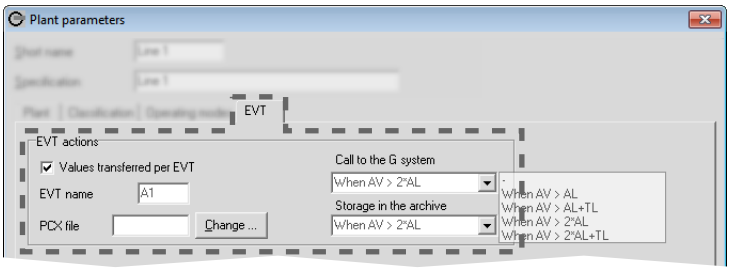
- Formulas see "Programming formulas", page 66.
- The formulas are executed every 5 seconds.

Usage examples:
– Status "shutdown operation", calculated from the individual plant status
– Status "current fuel" for incineration plants, calculated as logical link from the respective plant status

3.7.6 Configuring the remote transfer for the plant (note)

Only applies for MEAC software with the option "Emission data remote transfer".

Fig. 15: Configuration *Functions for remote transfer of plant data (note)*



▶ See "Technical Information MEAC300 Add-ons" → "Emission data remote transfer (ERT)" for a description of these functions.

Further settings for the remote transfer
- see "Configuring remote transfer for a component (note)", page 60;
- see "Configuring remote transfer for a counter (note)", page 63.

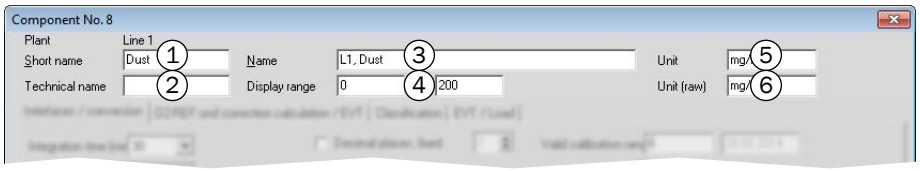
3.8 Configuring a component

▶ *Carry out these procedures for all components of all plants.*

Purpose and effect of a component, see "Structuring unit "Component"", page 24.

3.8.1 Defining identification and display range

Fig. 16: Configuration Components: Identification and display



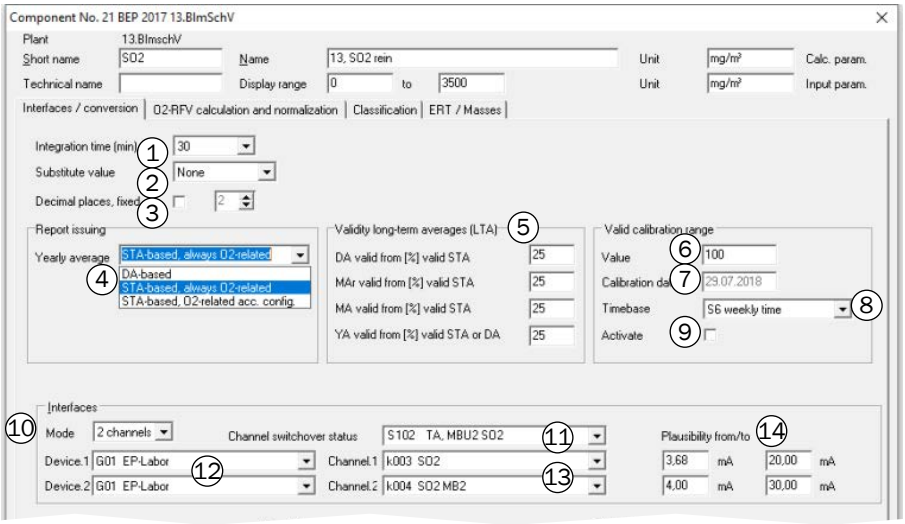
1	▶ Enter a short name for this component.[1]
2	▶ *If required:* Enter the UPI name for this component.
3	▶ Enter the MEAC-internal identification for this component.[2]
4	▶ Define the display range for displays on the screen.
5	▶ Enter the physical unit of this component.
6	▶ Enter the physical unit for the momentary value [3] of this component.

[1] Used in tabular representation.
[2] Used in programmed functions. – *Recommendation:* Integrate the name of the plant.
[3] Without MEAC-internal physical scaling.

An existing component can be duplicated (via context menu, see "in Simulation mode – main window (example)", page 29).

3.8.2 Configuring component acquisition

Fig. 17: Configuration Component: Signal sources



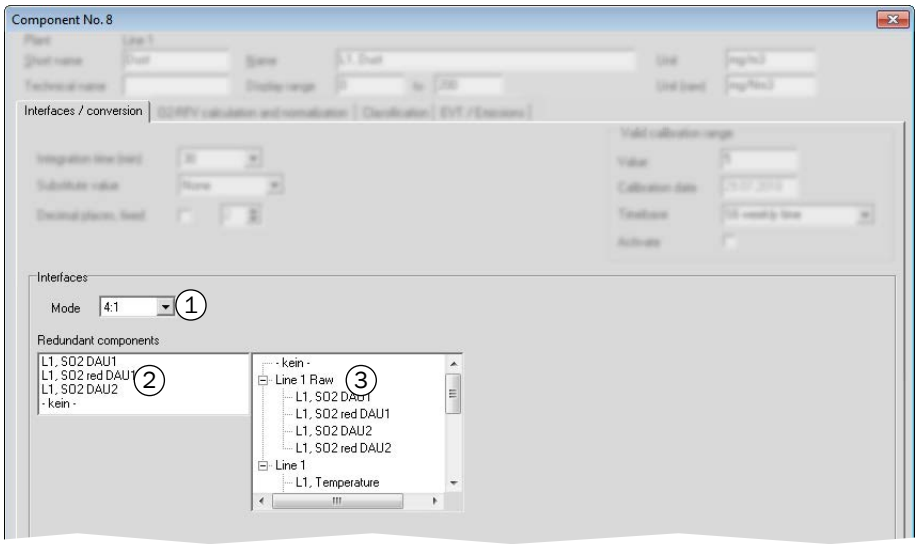
1	▸ Set the average time. [1]
2	▸ Select a default value. [2]
3	▸ Select number of decimal places to show the value of the component.
4	▸ Select type of annual value for the report [3]
5	▸ Enter valid-from % value for each LTA. (LTA: long-term averages) [4]
6	▸ Enter the end value of the “valid calibration range” (explanation, see “Valid calibration range”, page 21).
7	▸ Day on which this “valid calibration range” was activated (automatic entry; effect, see “Valid calibration range”, page 21).
8	▸ Select the time interval used for evaluation of the “valid calibration range” (explanation, see “Valid calibration range”, page 21).
9	▸ Apply this “valid calibration range” for the evaluation when the evaluation configuration is activated anew. [5]
10	▸ Select the type of signal source (mode). [6]
11	▸ Select the signal which activates the second measuring range or the second channel (depending on mode).
12	▸ Select the device [7] which receives the measuring signal. [8]
13	▸ Select the analog input [7] which receives the analog measuring signal. [8]
14	▸ Define the range in which the input signal is considered to be valid (plausibility range). [9]

[1] Explanation, see “Average values, average time”, page 13. Possible values: 1/3/10/20/30/60/120/240/480 minutes. Observe official regulations. – *NOTICE:* All components assigned to a virtual analyzer (see “Assigning the component to a virtual analyzer (IED)”, page 59) must have the same integration time.
[2] *IED default values:* The default value is used instead of the current momentary value of the component when the current value of the component is not available temporarily (e.g. due to malfunction/maintenance/ calibration).
BEP default values: The default value is used for scaling and O_2 reference value calculation for an average value when the respective scaling or reference value component was valid for less than two-thirds of the average time. Mode selection, see “Setting BEP evaluation parameters”, page 35.
Notice: Default values may not be used for emission components (*Exception:* “Check Cycle” see “Current emission values”, page 12).
[3] Possible settings:
DA-based = on DA basis
STA-based, always O2-related = on STA basis always O2 related
STA-based, O2-related acc. config = on STA basis acc. to configuration
Note: Collective setting for all components possible via context menu (see Fig. 5, page 29).
[4] Valid value range: 0% < x =< 100%
Note: Collective setting for all components possible via context menu (see Fig. 5, page 29).
[5] Restarts the evaluation of the “valid calibration range” as soon as the data model is activated. (Explanation, see “Valid calibration range”, page 21).
[6] “Virtual” = internally calculated value. Further information, see “Mode for redundant signal sources”, page 40
[7] MEAC-internal identifier (see “Configuring interface and hardware inputs”, page 32), e.g. for a data acquisition unit.
[8] *When the signal source type is “2 Channel”:* Make this setting for both channels.
[9] When a momentary value is lower than the lower value, this momentary value is invalid. When a momentary value is greater than the upper value, the upper value is automatically used instead of the real momentary value.

Mode for redundant signal sources

Purpose and origin of redundant signal sources, see “Redundant signal sources”, page 25.

Fig. 18: Configuration Component: Modes for redundant signal sources



1	Select the type of signal source (mode): – *When the component is an emission component:* Select “4:1”. – *When the component is a reference value component:* Select “4:1 Ref.”. [1]
2	Selected signal sources for this component.
3	List of possible signal sources for this component.

[1] Reference value components are used for scaling or O_2 reference value calculations. Components with this mode are taken into account before the other components during mathematical processing.

To add a signal source: 1 Doubleclick the empty entry. 2 Doubleclick the desired signal source in the list of signal sources.
To change a signal source: 1 Doubleclick a signal source. 2 Doubleclick the desired signal source in the list of signal sources.
To delete a signal source: 1 Doubleclick the signal source. 2 Doubleclick “–none–” in the list of possible signal sources.
To change the sequence of the signal sources: [1] ▸ Move the entries via Drag&Drop.

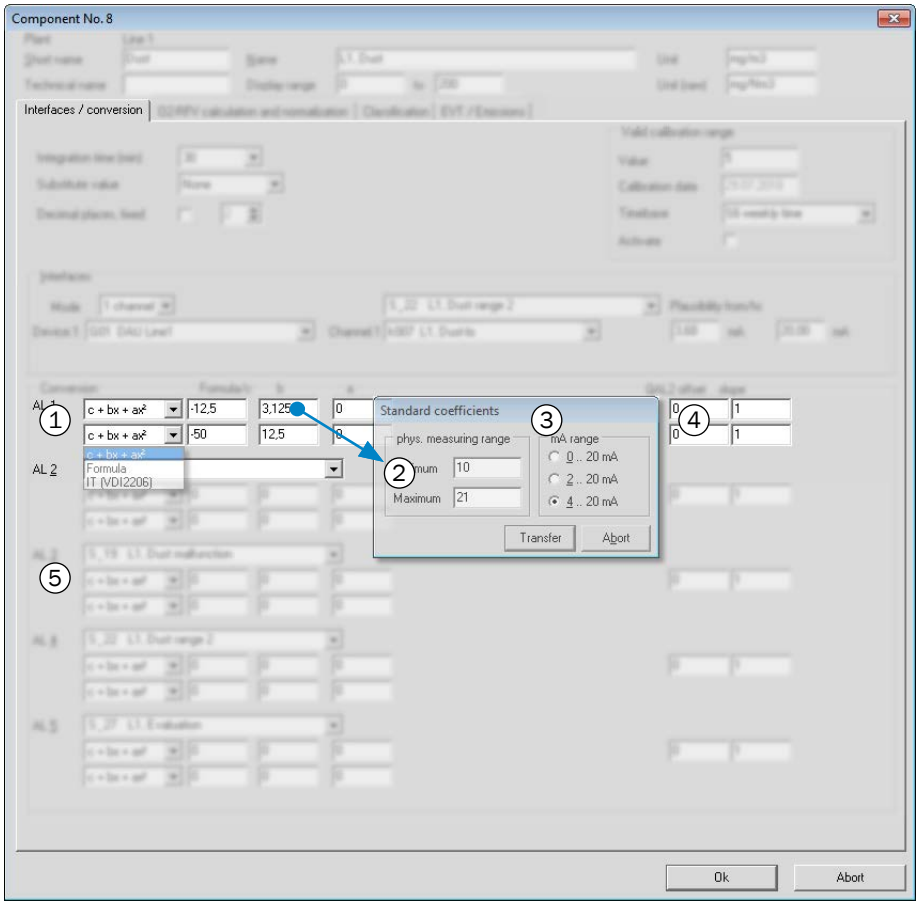
[1] The sequence defines the priority during evaluation.

Automatic selection of the signal source:
MEAC300 automatically decides which signal source is used based on the following criteria:
1 The program checks which of the redundant signal sources delivers a valid measured value. The first signal source in the list which delivers a valid measured value is used. [1]
2 When no signal source delivers a valid measured value, it is checked whether status signal “Check Cycle” is activated for a signal source (see “Current emission values”, page 12). When this is the case, the last valid momentary value of this signal source is used as default value for the current measured value.
3 When status signal “Check Cycle” is not activated for one of the signal sources, the signal source where the analyzer is in “Maintenance” status is used.
When none of these criteria are usable, the current momentary value is considered invalid.

[1] Valid = not in status “Malfunction”, “Maintenance”, “Calibration”, “Plausibility malfunction” or “Check Cycle”.

3.8.3 Configuring the physical conversion

Fig. 19: Configuration Component: Conversion



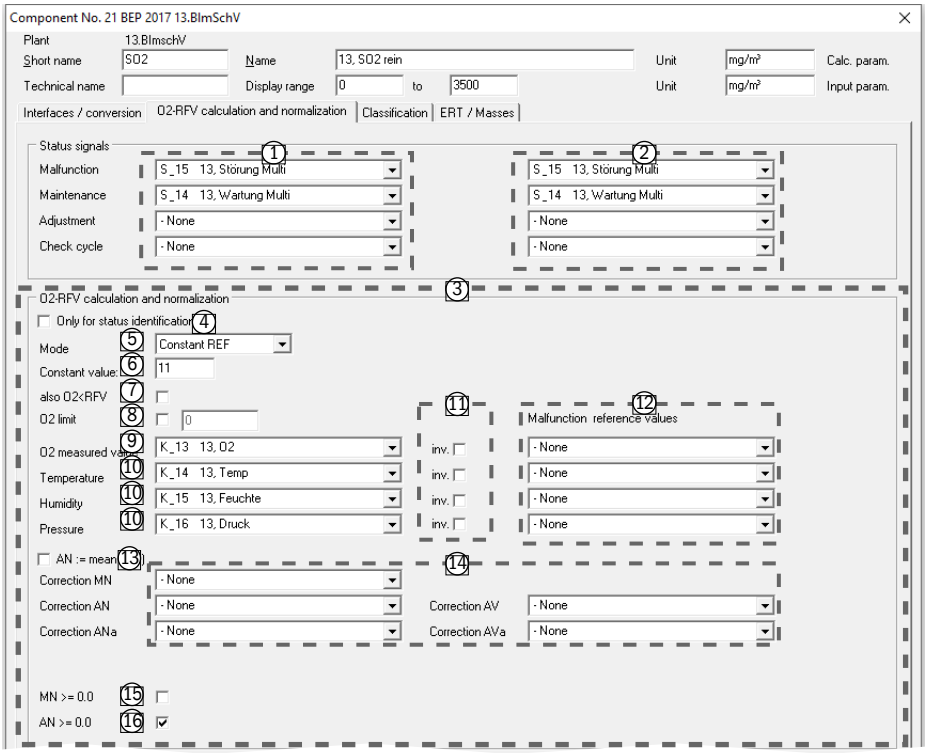
1	▸ Define how the momentary values of this component are converted from the electric measuring signal (mA value) to the physical measured value: – with a linearization function (enter formula parameters here) – with a programmed formula (see “Programming formulas”, page 66) – according to standard for soot number.
2	*To have a linearization function calculated automatically:* 1 Doubleclick field “b”. 2 Enter start value and end value of the physical measuring range. 3 Mark the electronic signal range of the measuring signal (mA range). 4 Click the button to transfer.
3	▸ Enter the “confidence range” which is subtracted from the average value during validation. [1]
4	▸ Define correction for QAL2 (addend|factor; *no correction:* 0|1).
5	▸ *If required:* Define conversions for max. 4 other measuring conditions. [2]

[1] Observe applicable guideline or regulation. Observe calculation methods, see “General classification settings – for IED evaluations”, page 43; in Germany, the value is equivalent to the determined “standard deviation” of the component.
[2] Signal the current measuring conditions via an input which is configured accordingly (see “Configuring interface and hardware inputs”, page 32).

3.8.4 Configuring status signals, reference value calculation and scaling

Not available when a mode is selected for redundant signal sources (see page 40).

Fig. 20: Configuration *Component: Status signals, O_2 reference value calculation, scaling*



1	► Select the status signals which should be taken into account during evaluation. [1]
2	► *Depending on the mode (see "Configuring component acquisition", page 39):* Select the same settings for the second channel.
3	► Settings for scaling and O_2 reference value calculation
4	► Do not carry out scaling and O_2 reference value calculations for this component but consider the status of the reference variables/scaling variables. [2] [3]
5	► Select mode of O_2 reference value calculation.
6	► In appropriate mode: Enter the constant reference value.
7	► Also carry out the O2 reference value calculation for O2 measured values lower than the O2 reference value.
8	► Limit the O_2 value to this value during the O_2 reference value calculation.
9	► Select the signal source of the O_2 measured value which should be used for the O_2 reference value calculation.
10	► Select components for scaling *(as required, e.g. for pressure or temperature compensation)*.
11	► Invert the factor for O_2 reference value calculation/scaling. [4]
12	► *If required:* Select the second (alternative) signal source for the reference value. [5]
13	► *For usage where the physical conditions can fluctuate strongly within the average time:* For the scaling and O_2 reference value calculations of the average value, use the momentary values for which the scalings and O_2 reference value calculations have already been used. – Only use with permission from the responsible Supervisory Authority. *Usage example:* Asphalt mixing plants.
14	Settings for scaling/O_2 reference value calculation. ► *When required:* Select formulas for scaling/O_2 reference value calculation. [6] Also consider formulas for the anytime O_2 related scaled and validated average values RNj/RVj.
15	► Output negative scaled momentary values as "0".
16	► Output negative scaled average values as "0".

[1] *Observe for components with default value:* When status "Malfunction" is determined using a formula (see "Defining internal statuses", page 64), this formula must be executed before the preliminary average value is calculated.
[2] *Typical usage:* For a component which is a mass flow (product of gas concentration and volume flow).
[3] Independent of this: When status signal "Malfunction", "Maintenance" or "Calibration" is activated as source for a reference or scaling value at the end of an average time, value "E" is stored as second status identifier of the average value (see "Status identifiers of average values", page 81).
[4] Must be activated when this component is an emission volume flow.
[5] Is used automatically instead of the first signal source when status signal "Malfunction", "Maintenance" or "Calibration" is activated for the first signal source. In this case, the message "Malfunction reference value" (E) is not generated.
[6] Information on formulas, see "Programming formulas", page 66. – An O_2 reference value calculation is executed *before* these formulas.

3.8.5 General classification settings – for IED evaluations

Fig. 21: Configuration *Component: General classification settings (acc. to IED)*

1	► Select the calculation method for the set value in the confidence range [1]: – Subtract the value as constant physical value from the average value.[2] – Subtract the value as percentage share of the average value from the average value. – Subtract the value as percentage share of the average value from the average value, but not more than the same percentage share of the average limit. – Subtract the value as percentage share of the average value from the average value, but not more than the same percentage share of the displayed value. [3]
2	► Activate the count of the average values that are greater than the average limit for this component. [4][5]
	► Avoiding a double count (see below).
3	► Enter how many average values per day must be greater than the average limit before these average values are counted. [5]

[1] see “Configuring the physical conversion”, page 41.
[2] This is equivalent to the “standard deviation” in the German Directives.
[3] When a classification mode that uses a daily limit has been configured, the daily limit or the special daily limit will be shown and used here.
[4] Time interval of count, see “Setting BEP evaluation parameters”, page 35.
[5] Not for evaluation according to German Directives.

NOTE: Avoiding a double count

In MEAC300, a single real emission component can be represented with several different components (e.g. CO as “CO” *and* “CO 10 minutes”).

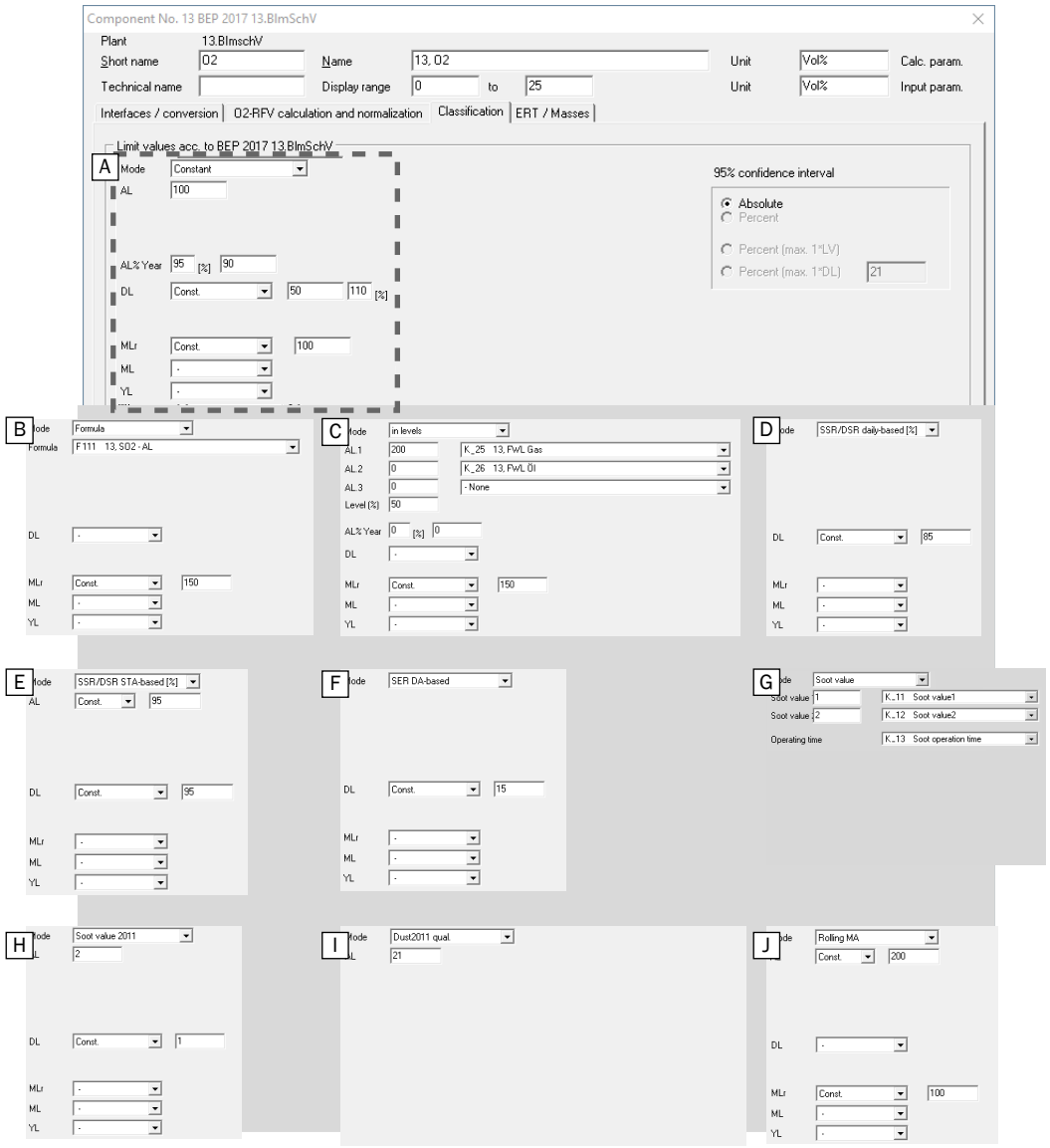
When components which originate from the same real emission component have different average times in MEAC300:

► Only activate the count of values that are compared with a limit value for one of these components.

3.8.6 Configuring classifications for TI Air/13th BImSchV/IED Power

- Most of the settings for TI Air, 13th BImSchV and IED Power are identical.
- IED Power = application of Directive 2010/75/EU to power plants.
- TI Air has no monthly limits.

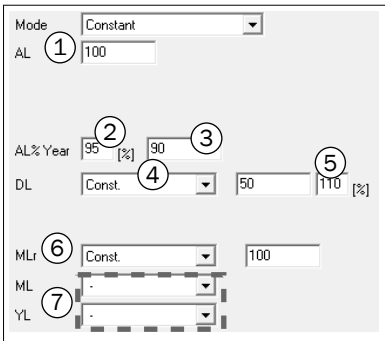
Fig. 22: Configuration *Classifications for 13th BImSchV/TI Air/IED Power: Overview}*



Explanation, see page 45.

Fig. 23: Classifications for 13th BImSchV/TI Air/IED Power: Functions

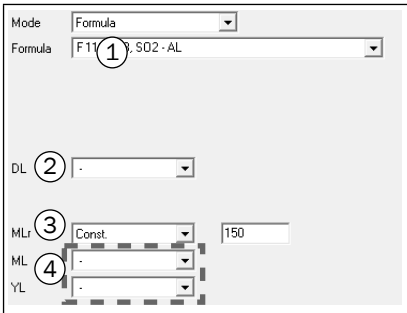
A



Constant average limit	
1	► Enter the average limit.
2	► Enter how many percent of the validated average values within a year must comply with the special average limit [3], so that no corresponding message is generated at the end of the year.[1]
3	► Enter the limit value for [2]. [2]
4	► Perform for the daily limit value: – If the daily value is not to be compared against a limit value, select "–". – Otherwise: select "Const." and enter the daily limit. – Or: Select "Formula" and specify the numerical formula used to dynamically calculate the daily limit.
5	► Enter the factor (%) with which the daily limit is multiplied before the daily value is compared with the daily limit. [3]
6	► Perform for the rolling monthly limit value: [4] – If the monthly value is not to be compared against a limit value: Select "–". – Or: select "Formula" and specify the numerical formula used to dynamically calculate the monthly limit.
7	► Carry out for the monthly limit and the yearly limit: – *When the monthly value/yearly value is not to be compared with this limit:* Select "–". – *Otherwise:* Enter the limit. [5] – Or: Select "Formula" and specify the numerical formula used to dynamically calculate the *Monthly limit / Yearly limit* and '*Daily limit-average*' for *Yearly limit*. [6]

[1] Not present for 13th BImSchV/TI Air. – Standard value for IED Power: 95%.
[2] Validated average values that are not greater than this value are counted in class J1. Validated average values that are greater than this value are counted in class JS1. – Not present for 13th BImSchV/TI Air.
[3] Not present for 13th BImSchV/TI Air. – Standard factor for IED Power: 110%. The days in the calendar year on which the daily value was greater than [daily limit × factor] are counted.
[4] The rolling monthly limit/value and the associated events in the report are only output when activated in the plant parameters.
[5] Standard value for monthly limit: The daily limit.
[6] The 'Daily limit average' option is only visible with a dynamic daily limit (formula).

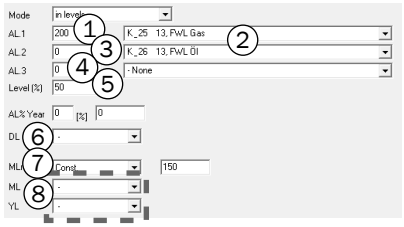
B



Average limit from formula	
1	► Select the numeric formula with which the average limit is calculated
2	► Perform for the daily limit value: – If the *daily value* is not to be compared against a limit value: Select: "–". – Otherwise: Select "Const." and enter the daily limit value. – Or: Select *AL average value*.
3	► Perform for the rolling monthly limit value: [1] – If the *Monthly value* is not to be compared against a limit value: Select "–". – Otherwise: select "Const." and enter the daily limit value. – Or: Select "Formula" with which the rolling monthly limit value is calculated dynamically: – Or: Select *AL average value*.
4	► Carry out for the monthly limit and the yearly limit: – *When the monthly value/yearly value is not to be compared with this limit:* Select "–". – *Otherwise:* Enter the limit. [2] – Or: Select "Formula" and specify the numerical formula used to dynamically calculate the *Monthly limit / Yearly limit* and '*Daily limit-average*' for *Yearly limit*.

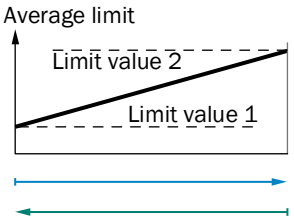
[1] The rolling monthly limit/value and the associated events in the report are only output when activated in the plant parameters.
[2] Standard value for monthly limit: The daily limit.

C



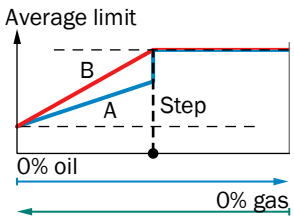
Dynamic limit value

Mode: Rolling



The current limit value is calculated based on the proportionate rated thermal input.

Mode: A = level / B = refinery

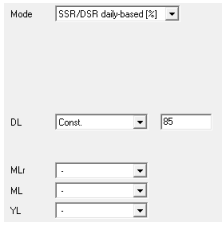


When the share of the rated thermal input with the higher limit value exceeds the limit value determined as “Level”, the higher limit value is constantly used.

1	► Enter the first limit value. [1]
2	► Select the component for the rated thermal input concerned.
3	► Perform the same settings for the second limit value.
4	► For “rolling”: Perform the same settings for the third limit value.
5	► *For “level” and “refinery”:* Enter the switching level. [2]
6	► Perform for the daily limit value: – If the *daily value* is not to be compared against a limit value: Select: “–”. – Otherwise: Select “Const.” and enter the daily limit value. – Or: Select “Formula” and specify the numerical formula used to dynamically calculate the daily limit. – Or: Select “Average limit average value” and specify the factor with which the daily limit is calculated dynamically from the average limits.
7	► Perform for the rolling monthly limit value: [3] – If the Monthly value is not to be compared against a limit value: select “–”. – Otherwise: Select “Const.” and enter the daily limit value. – Or: Select “Formula” and specify the numerical formula used to dynamically calculate the daily limit. – Or: Select “Average limit average” and specify the factor with which the daily limit is calculated dynamically from the average limits.
8	► Carry out for the monthly limit and the yearly limit: – *When the monthly value/yearly value is not to be compared with this limit:* Select “–”. – *Otherwise:* Enter the limit. [4] – Or: Select “Formula” and specify the numerical formula used to dynamically calculate the *Monthly limit / Yearly limit* and '*Average limit-average*' for *Yearly limit*.

[1] For modes 4 and 5, this must be the lower limit value.
[2] Standard value: 50%.
[3] The rolling monthly limit/value and the associated events in the report are only output if activated in the plant parameters.
[4] Standard value for monthly limit: The daily limit.

D



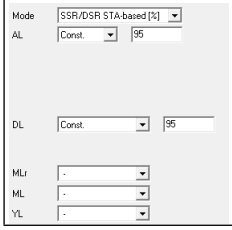
Sulfur separation rate [%], relative to daily values

Monitoring the daily values and yearly values of the of the sulfur separation rate (SSR) or desulfurization rate (DSR). [1]

► Enter the daily limit and yearly limit.
► Or select the “Formula” that creates the daily limit.
► Select “-” for the rolling monthly limit value and for the monthly limit value in the usual way.

[1]In contrast to the SSR, the DSR refers only to the SO_2 fraction that is separated by the desulfurization equipment. The SSR still contains the sulfur component which remains in the ash. This is to be represented in the formula for the SSR percentage value by increasing the SO_2 measured value in the raw gas by factor 1.1.

E



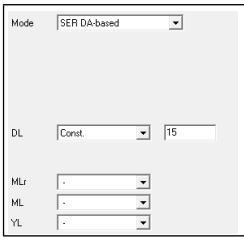
Sulfur separation rate [%], relative to average values and daily values

Monitoring the daily values and yearly values of the of the sulfur separation rate (SSR) or desulfurization rate (DSR) [1]

► Enter the average limit, daily limit and yearly limit.
► Select “-” for the rolling monthly limit value and for the monthly limit value in the usual way.

[1] In contrast to the SSR, the DSR refers only to the SO_2 fraction that is separated by the desulfurization equipment. The SSR still contains the sulfur component which remains in the ash. This is to be represented in the formula for the SSR percentage value by increasing the SO_2 measured value in the raw gas by factor 1.

F

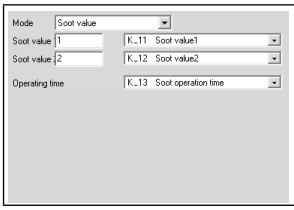


Sulfur emission rate

Monitoring the daily values of the sulfur emission rate

- ► Either enter the daily limit
  Or select the formula to create the daily limit.
- ► Select "-" for the rolling monthly limit value and for the yearly limit value in the usual way.

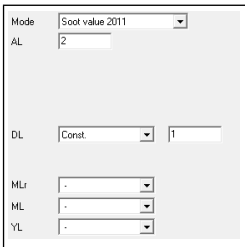
G



Soot value

Three counters must be configured and entered here for evaluation of soot value overruns.

H



Soot value 2011

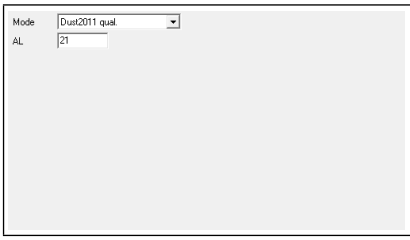
All soot value classes acc. to SIC are generated automatically depending on the Directive and average time.

Usual average time: 3 minutes.
- – Alternative for older evaluations: 1 minute.
- – Alternative for older plants: 30 minutes.

- ► *For TI Air/3 minutes, 13th BImSchV/3 or 30 minutes, 1st BImSchV/3 minutes:* Enter the average limit and the daily limit for the soot value.
- ► Select "-" for the rolling monthly limit value and for the yearly limit value in the usual way.
- ► *For TI Air/1 minute, 1st BImSchV/1 minute:* Enter the daily limit for the soot value.

Usual limits acc. to 13th BImSchV:
- – *For gas turbines operated with liquid fuels:* AL = 2, DL = 1 (-evaluate startup operation with AL = 4 and DL = 2)
- – *For large incineration plants operated with light fuel oil:* AL = 1, DL = 0.5

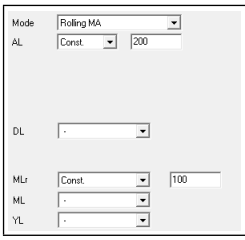
I



Dust 2011 qualitative

- ► Enter the alarm threshold for the momentary values.

J



Rolling monthly average

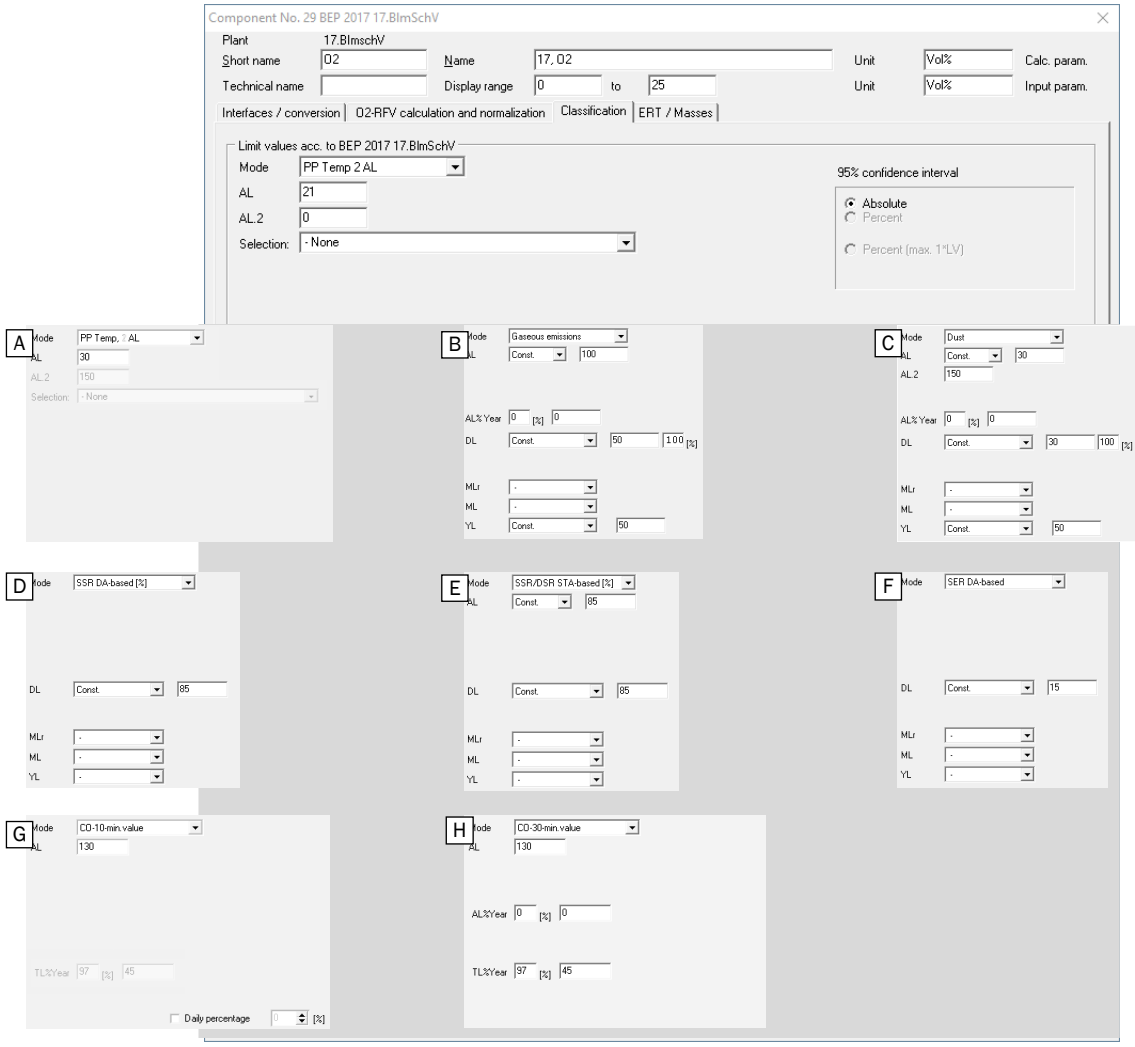
Monitoring the rolling monthly averages in daily classes [1]
- ► Enter the average value.
- ► Enter the rolling monthly limit.
- ► Select "-" for the rolling monthly limit value and for the yearly limit value in the usual way.

[1] If a value is entered for the daily limit, there is nevertheless no classification with respect to this value in this mode. Only events are monitored. In any case, the daily classes refer to the rolling monthly limit.

3.8.7 Configuring classifications for the 17th BImSchV/IED Waste/FNADE

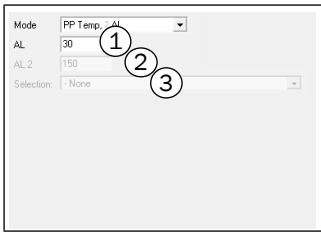
- Most of the settings for the 17th BImSchV and IED Waste/FNADE are identical.
- IED Waste = application of Directive 2010/75/EU to waste incineration.

Fig. 24: Configuration *Classifications for 17th BImSchV/IED Waste/FNADE: Overview*



Explanation, see page 48.

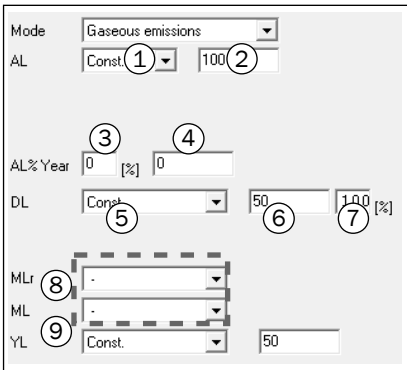
Fig. 25: Classifications for 17th BImSchV/IED Waste/FNADE: Functions



	Post combustion temperature
	• *Mode 1:* Post combustion temperature, one average limit [1] • *Mode 2:* Post combustion temperature, two average limits [1]
1	► Enter the average limit of this component.
2	► *Only for mode 2:* Enter the second average limit of this component.
3	► Select the status signal which activates the second limit value.

[1] Average limit values serve as minimum values here.

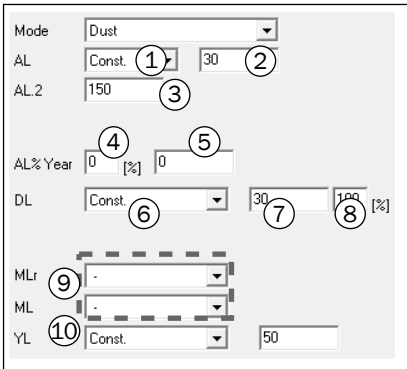
B



	Gaseous emissions
1	▸ Select the mode for the average limit (constant value or dynamic value from a formula).
2	▸ Enter the average limit of this component. - *Or:* ▸ Select the formula which calculates the average limit of this component.
3	▸ Enter how many percent of the validated average values within a year must comply with the special average limit [4], so that no corresponding message is generated at the end of the year. [1]
4	▸ Enter the limit value for [3].
5	▸ Select the mode for the daily limit (constant value or dynamic value from a formula).
6	▸ Enter the daily limit of this component. - *Or:* ▸ Select the formula which calculates the daily limit of this component.
7	▸ Enter the factor (%) with which the daily limit is multiplied before the daily value is compared with the daily limit. [2]
8	▸ Select "-" for the rolling monthly limit value and for the monthly limit value in the usual way.
9	▸ Enter the yearly limit of this component.

[1] Not present for 17th BImSchV – Standard value for *IED Waste:* 97%.
[2] Not present for 17th BImSchV – Standard factor for *IED Waste*: 100%. The days in the calendar year on which the daily value was greater than [daily limit × factor] are counted.

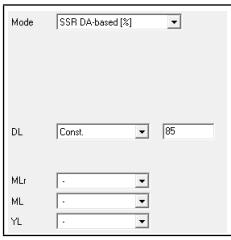
C



	Dusty emissions
1	▸ Select the mode for the average limit (constant value or dynamic value from a formula).
2	▸ Enter the average limit of this component. Or: Select the formula that calculates the average limit of this component.
3	▸ Enter the average limit which is applied instead of the average limit [2] when the flue gas purification unit is faulty.
4	▸ Enter how many percent of the validated average values within a year must comply with the special average limit [5], so that no corresponding message is generated at the end of the year. [1]
5	▸ Enter the limit value for [4].
6	▸ Select the mode for the daily limit (constant value or dynamic value from a formula).
7	▸ Enter the daily limit of this component. - *Or:* ▸ Select the formula which calculates the daily limit of this component.
8	▸ Enter the factor (%) with which the daily limit is multiplied before the daily value is compared with the daily limit. [2]
9	▸ Select "-" for the rolling monthly limit value and for the monthly limit value in the usual way.
10	▸ Enter the yearly limit of this component.

[1] Not present for 17th BImSchV – Standard value for *IED Waste*: 97%.
[2] Not present for 17th BImSchV – Standard factor for *IED Waste:* 100%. The days in the calendar year on which the daily value was greater than [daily limit × factor] are counted.

D

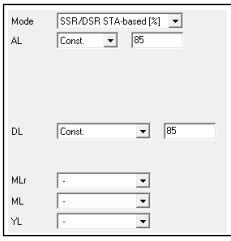


Sulfur separation rate [%], relative to daily values

Monitoring the daily values of the sulfur separation rate

▸ Either enter the daily limit.
Or select the formula that creates the daily limit.
▸ Select "-" for the rolling monthly limit value and for the yearly limit value in the usual way.

E

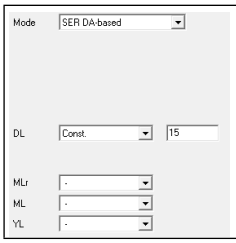


Sulfur separation rate [%], relative to average values and daily values

Monitoring the average values and daily values of the sulfur separation rate

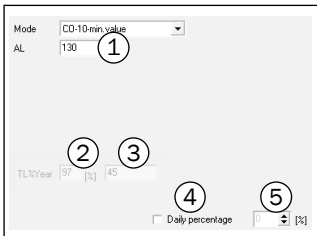
▸ Enter the average limit and daily limit.
▸ Either enter the limit values.
Or select the formulas that create the limit values.
▸ Select "-" for the rolling monthly limit value and for the yearly limit value in the usual way.

F



Sulfur emission rate
Monitoring the daily values of the sulfur emission rate ► Either enter the daily limit. Or select the formula that creates the daily limit. ► Select “-” for the rolling monthly limit value and for the yearly limit value in the usual way.

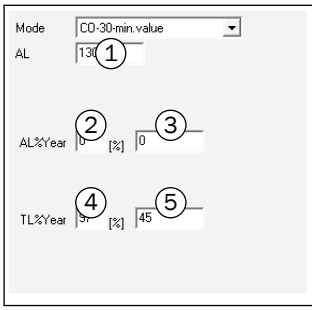
G



	CO 10-minute value [1]
1	► Enter the average limit of this component.
2	► Enter the percentage of the validated daily values within a year that must comply with the special daily limit [3], so that no corresponding message is generated at the end of the year.[2]
3	► Enter the limit value for [2].
4	► Calculate the share of average values which were greater than the average limit for each calendar day and compare the calculated value to the limit value [[5]].
5	► Set how high the share of [4] is allowed to become before a message is generated.

[1] Only use for component “CO” with average time = 10 minutes.
[2] Standard value: 97%.

H

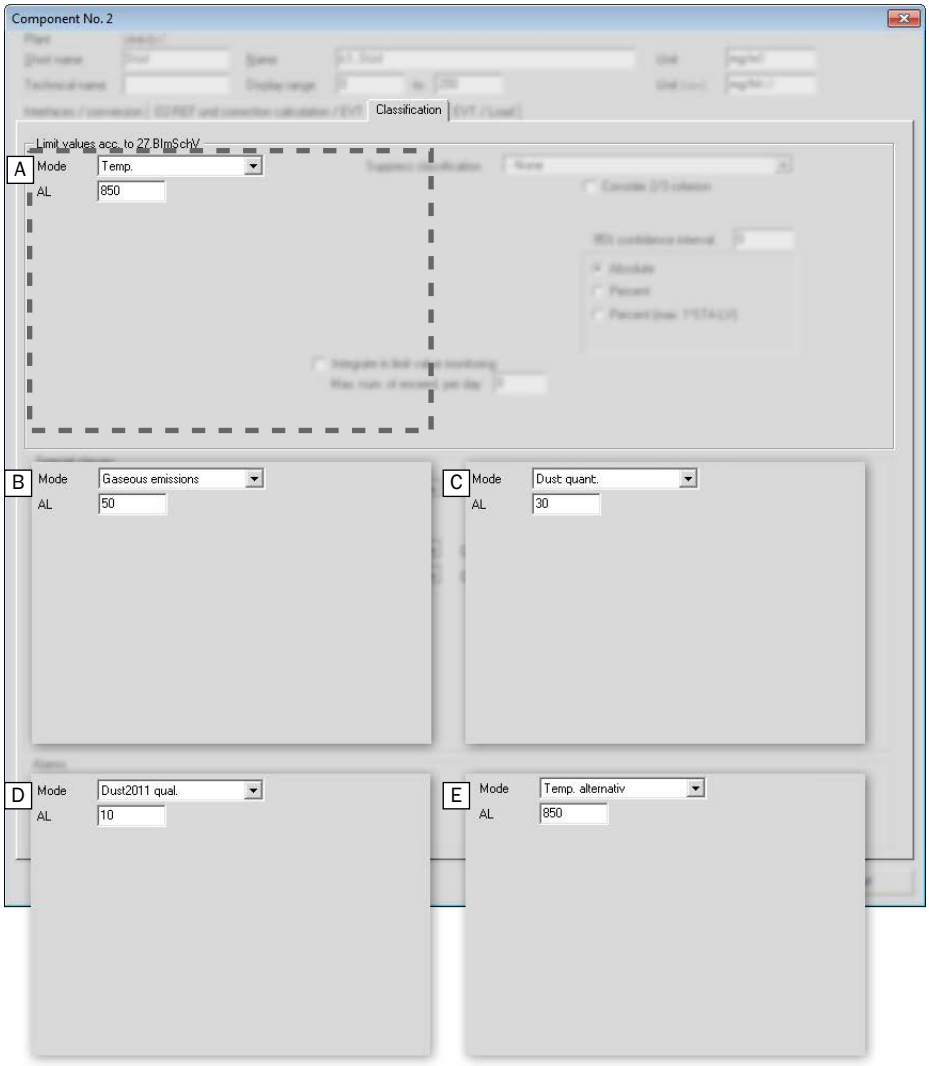


	CO 30-minute value *– only for IED Waste/FNADE for component “CO” with average time “30 minutes” –*
1	► Enter the average limit of this component.
2	► Enter the percentage of the validated daily values within a year that must comply with the special average daily limit [3], so that no corresponding message is generated at the end of the year.[1]
3	► Enter the limit value for [2].
4	► Enter the percentage of the validated daily values within a year that must comply with the special average limit [5], so that no corresponding message is generated at the end of the year.
5	► Enter the limit value for [4].

[1] Standard value: 97%.

3.8.8 Configuring classifications for 27th BImSchV

Fig. 26: Configuration *Classifications for 27th BImSchV*



A	*Temperature in the post combustion zone*
	Classes, see “Classes for temperature in the post combustion zone – 27th BImSchV (standard)”, page 89.
	► Enter the minimum temperature.

B	*Gaseous emissions* (e.g. CO)
	Classes: Standard classes up to S11 (see “Standard classes”, page 83).
	► Enter the average limit.

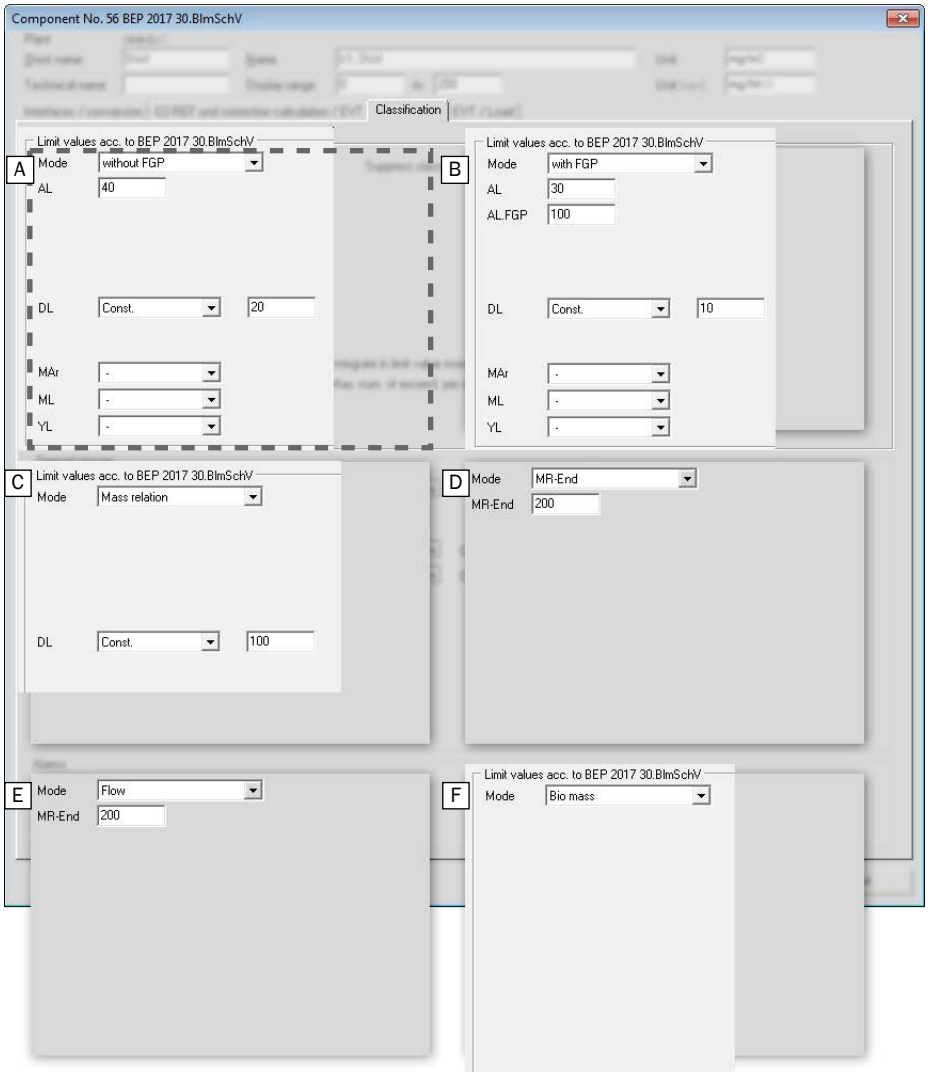
C	*Dust quantitative*
	Classes, see “Classes for “Dust quantitative” – 27th BImSchV”, page 86.
	► Enter the average limit.

D	*Dust 2011 qualitative*
	Classes, see “Classes for “Dust qualitative” – TI Air/13th BImSchV/27th BImSchV”, page 86.
	► Enter the alarm threshold for the momentary values.

E	*Temp. alternative*
	Classes, see “Classes for temperature in the post combustion zone – 27th BImSchV “alternative””, page 89.
	► Enter the minimum temperature.

3.8.9 Configuring classifications for 30th BImSchV

Fig. 27: Configuration *Classifications for 30th BImSchV*



A	Normal component (without monitoring of the flue gas purification plant)
	► Enter the average limit. ► Enter the daily limit. ► Select "-" for the rolling monthly limit value and for the yearly limit value in the usual way.
B	Component with monitoring of the flue gas purification plant (dust)
	► Enter the average limit. ► Enter the average limit which is applicable when the flue gas purification plant failed. ► Enter the daily limit. ► Select "-" for the rolling monthly limit value, the monthly limit and for the yearly limit value in the usual way.
C	Mass relation (emitted pollutant volume/fuel used)
	► Enter the daily limit.
D	Component without limit monitoring (N_2O)
	► Enter the measuring range end value.
E	Component without limit and calibration range monitoring (volume flow)
	► Enter the measuring range end value.
F	Amount of fuel consumed (biomass)
	► No limit values are monitored.

3.8.10 Configuring the evaluation for special classes and “special operating modes”

Purpose of special classes

- Counting average values according to special criteria.
- Marking emission values informatively.

Rules for status “Start-up operation” and “Shutdown operation”

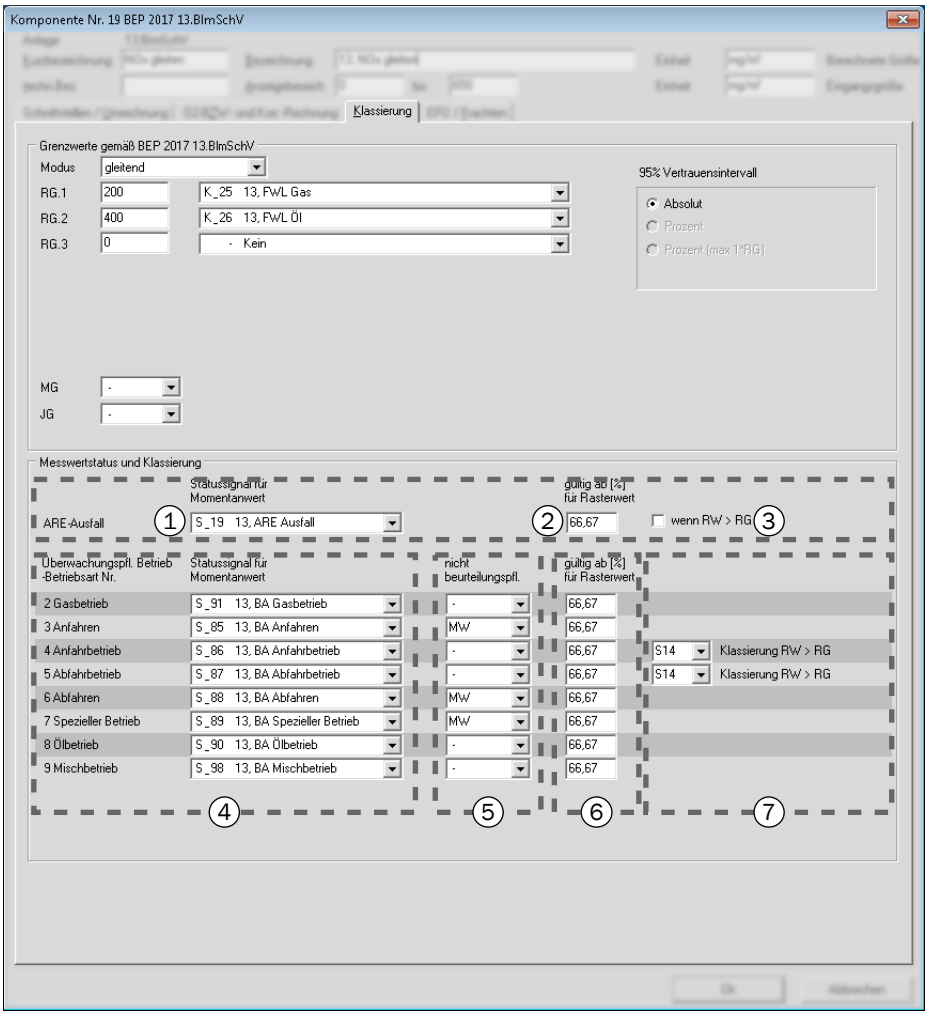
Concerns	Rule
Certain components according to individual official determination (notice of approval)	The corresponding status must be configured for component classification in special classes “Start-up/ Shutdown operation”.
– TI Air – 13th BImSchV – 17th BImSchV – IED Power	When the average value is greater than the average limit and, at the end of the average time, status “Start-up operation” or “Shutdown operation” is effective, the average value is assigned to a special class (see “Special classes for start-up operation and shutdown operation”).

Special class	*Start-up operation* [1]			*Shutdown operation* [1]		
	TI Air	13th BImSchV IED Power [2]	17th BImSchV	TI Air	13th BImSchV IED Power [2]	17th BImSchV
S1	●	○	●	●	●	●
S14	●	●	–	●	●	–
S17	●	–	●	●	–	○

Table 1: Special classes for start-up operation and shutdown operation

[1] ○ = not specified in BEP/SKK but possible in MEAC300 (for individual official requirement).
[2] Also used for thermal power stations with sewage sludge incineration (17th BImSchV).

Fig. 28: Configuration *Component: Evaluation for special classes and "special operating modes" acc. to BEP*



Status signal for "Failure of flue gas purification"	
1	▸ Select the status signal which signals status "Malfunction of flue gas purification unit" for momentary values.
2	▸ Enter how high the percentage share of the momentary values must be within an average time for which status signal "FGP failure" was activated so that this status signal is used as "Measured value status 2"[1] for the average value and the average vale added to the corresponding special classes. [2][3]
3	*Only with permission from the responsible Supervisory Authority:* ▸ Only set "Measured value status 2" for the average value and only classify the average value in a special class when the average value is greater than the average limit.

[1] see "Status identifiers of average values", page 81.
[2] Standard value: 66.67% (two-thirds criterion).
[3] This evaluation is only made when, within the average time, at least two thirds of the momentary values of this component were subject to compliance.

Special operating modes		
4	▸ Select the internal status signals to signal status of the respective “special operating mode” for momentary values.	
	Configuration rules: • Real status signals may not be used here. Only use an internal status signal (see “Defining internal statuses”, page 64) that contains a link to a formula with status signal “Plant in compliance operation” (see Fig. 14, page 36 [1]) so that the internal status signal used is then only “activated” when status signal “Plant in compliance operation” is also activated. Configure the internal status so that the formula is executed before the momentary values have been updated. ▸ *Recommendation:* Define the internal status signals so that only one of these status signals can be triggered at any one time. • Explanation of operating modes “0” and “1”, see “Plant: BEP evaluation settings, Part 2 (example)”, page 36. • The priority of the “special operating modes” can be configured individually (apart from “0” and “1”). • Individual “special operating modes” can be added.	
	Evaluation rules • The resulting average values are marked automatically with the “special operating mode” number active for the majority for the momentary values during the average time. • The two-thirds criterion is not used in MEAC300. • *When several operating modes were active during the average time for an identical number of momentary values:* The operating mode with the lowest number (highest priority) is assigned. *Exception:* Operating modes as from “2” have priority over “0” and “1”. • *If a “special operating mode” cannot be determined:* Operating mode “0” is assigned.	
5	▸ Influencing the effect of the “special operating modes”.	
	Fixed rules:	
	– *For “Normal operation”, “Start-up operation” and “Shutdown operation”:*	▸ Set “–”.
	– *For “Start-up” and “Shutdown”:*	▸ Set “MW”.
	– *When a certain pollutant must be classified separately for each fuel and for mixed firing (multi-fuel firing plant)*	▸ Set “RW”.
	General rules:	
	– *When both momentary values and average values are subject to compliance:*	▸ Set “–”.
	– *When both momentary values and average values are not subject to compliance:*	▸ Set “MW”.
	– *When momentary values are subject to compliance but the respective average values are not:*	▸ Set “RW”.
6	▸ Enter how large the percentage share of the momentary values for which the “special operating mode” was active must be within an average time so that the average value is assigned the corresponding status identifier for “Measured value status 2”. [1]	
	Configuration rules: ▸ *For all predefined “special operating modes” and for all operating modes with status “not in compliance operation”:* Set “66.67%” (two-thirds criterion). ▸ Only set a different value with permission from the responsible Supervisory Authority. [2] ▸ *For criterion “At least one momentary value” and average time = 30 minutes:* Set 0.28%. [3]	
	Evaluation rules • Average values for which this criterion for a “special operating mode” is satisfied, are assigned the status identifier “Measured value status 2” associated with the respective “special operating mode”. • The average value is regarded as “not in compliance operation” when this “special operating mode” is marked “not in compliance operation”. • Average values that are “not subject to compliance” according to this criterion are marked with “N” (“not subject to compliance”) as status identifier for “measured value status 1” and added to special class S8.	
7	*Acc. to specifications from the responsible Supervising Authority (depending on the Directive applied):* ▸ For operating modes “Start-up operation” and “Shutdown operation” (subject to compliance), set the special class [4] in which the average values are to be counted when greater than the average limit.	

[1] Standard value: 66.67% (two-thirds criterion).
[2] E.g. for a multi-fuel firing plant.
[3] Calculation: Time component of a momentary value = 5 seconds, average time = 30 minutes → 1/(60 s/5 s · 30) · 100% = 0.278% → round to 2 decimal places → 0.28%.
[4] see “Configuring the evaluation for special classes and “special operating modes””, page 53.

- Configuring the set of “special operating modes”, see “Plant: BEP evaluation settings, Part 2 (example)”, page 36.
- Configuring individual “special operating modes”, see “Configuring individual “special operating modes””, page 37.

3.8.11 Activating the average value alarm (FNADE)

– Only valid for FNADE evaluations –

Purpose

The average value alarm records the temporary development of the average values:

Alarm level 1:	The last average value was greater than the alarm value and the current momentary value is lower than the alarm value.
Alarm level 2:	The last average value was greater than the alarm value and the current momentary value is also greater than the alarm value.
Alarm level 3:	The last two average values were greater than the alarm value.

The following can be used as alarm value (see “Component: Average value alarm”):

– The configured average limit.
– The set alarm value.

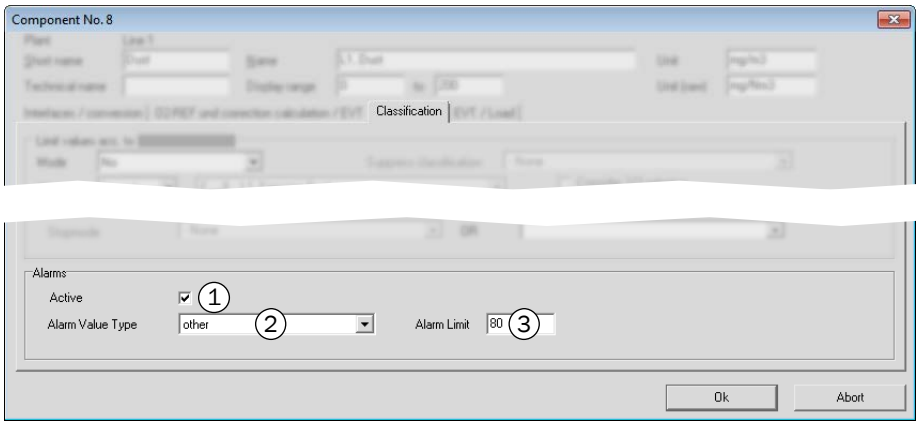
The average value alarm uses validated average values.

Effect of an average value alarm

- The alarm level is shown in the program section “Current” in the counter screen (→ “Operating Instructions MEAC300”).
- The digital output assigned to this alarm function (see “Configuring digital outputs”, page 70), is activated.

Setting/activating

Fig. 29: Configuration *Component: Average value alarm*



1	▸ Activate the average value alarm for this component.
2	▸ Select which value is used as alarm value for this component: – The average limit of the component. – The alarm value is entered here.
3	▸ *If required:* Enter the alarm value for this component.

3.8.12 Configuring calculation and monitoring of emission volumes

Calculation modes

Directive	Calculation mode
All – apart from IED Waste/FNADE	– An emission volume is calculated for every average time of the day. – This emission volume is multiplied (weighted) with the share of momentary values determined during the average time while status signal “compliance operation” was activated. – The daily volume is the total of weighted emission volumes for a day.
IED Waste/FNADE	– An emission volume is calculated for every average time. – This emission volume is multiplied with the share of valid momentary values generated during the average time. – The daily volume is the total of this emission volumes multiplied with the daily operating time [minutes] / (number of average values × average time [minutes]).

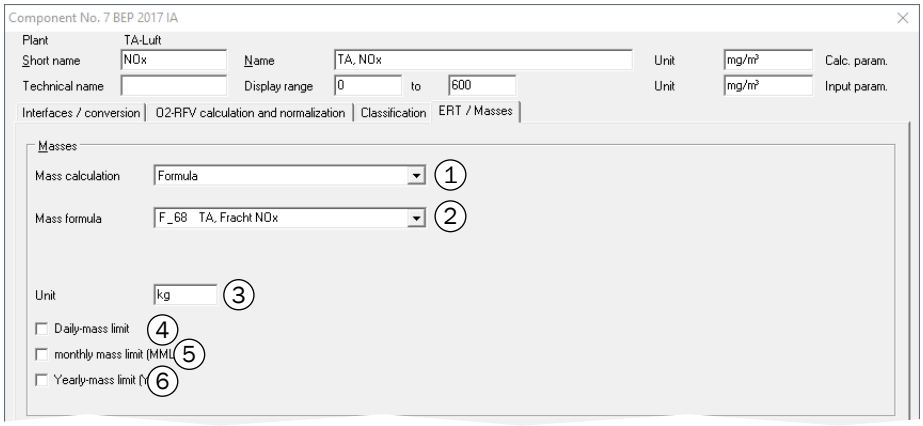
The emission volumes can also be calculated by specifying the relevant volume flow (see “Configuring the emission volumes calculation (simple method)”, page 58).

To display the emission volume in the “Current” settings:

- ▶ Either specify the limit value for the daily emission volume here (see “Component: Emission volume per formula (example)”).
- ▶ Or configure the volume flow processing (see “Configuring the emission volumes calculation (simple method)”, page 58).

Setting/activating

Fig. 30: Configuration *Component: Emission volume per formula (example)*



1	▶ *For this calculation method:* Select “Formula”.
2	▶ Select the formula to be used to calculate the emission volume for an individual average time (calculation information, see “Emission loads (amounts)”, page 18).
3	▶ Enter the physical unit of the formula result (standard: “kg”).
4	▶ *If required:* Activate the monitoring of the daily emission volumes.
5	▶ *If required:* Activate the monitoring of the monthly emission volumes.
6	▶ *If required:* Activate the monitoring of the yearly emission volumes.

- Downtimes of the plant are automatically taken into account for calculation of emission volumes.
- One formula is executed at the end of each average time.
- When using limit values for emission volumes, it must be ensured that the value types required by the authorities are used to calculate the emission volumes .[1]

[1] In Germany, validated values must be used in this case.

3.8.13 Configuring the emission volumes calculation (simple method)

This function is a method to calculate emission volumes without having to configure individual formulas (with formulas: see “Configuring calculation and monitoring of emission volumes”, page 57).

Program-internal calculation formula: $STE = RNa_C \cdot RNa_V \cdot t \cdot (N_{MR-B} / N_{MR})$	
STE	Short term emission (Short Term Emission)
RNa_C	*For the emission component:* Average value of all valid and scaled momentary values (including O_2 reference value calculation), created during the average time while status signal “compliance operation” was activated
RNa_V	As RNa_C, but for the flue gas volume flow
t	Average time
N_{MR-B}	Number of momentary values created during an average time while status signal “compliance operation” was activated
N_{MR}	Maximum number of momentary values in the average time.

- Default values cannot be defined for this function (see “Emission loads (amounts)”, page 18).
- This function is not effective when an individual formula to calculate the emission value is configured (see “Configuring calculation and monitoring of emission volumes”, page 57).

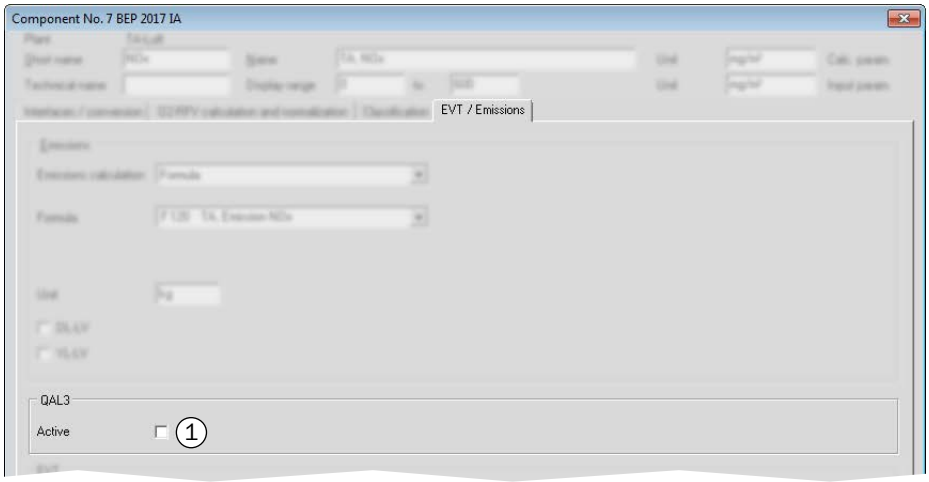
Fig. 31: Configuration *Component: Emission amount via volume flow (example)*

1	▸ *For the calculation method:* Select “Flow”.
2	▸ Select the component which represents the volume flow to be used to calculate the emission amount of these emission components. [1]
3	▸ Enter the mathematical factor for the program-internal calculation formula to multiply the emission amount to calculate the desired physical unit for the emission amount. [2]
4	▸ Enter the desired physical unit for the emission amount.
5	▸ see “Component: Emission volume per formula (example)”, page 57

[1] The component must be scaled (to physical standard conditions + O_2 reference value calculation).
[2] *Example:* The physical unit of the measured value for the emission component is “mg/m³”. The configured emission volume unit is “kg”. Then enter as factor: “1E-6” (1 mg = 10^{-6} kg).

3.8.14 Activating QAL3 evaluation of the component

Fig. 32: Configuration *Component: Activating QAL3 evaluation*



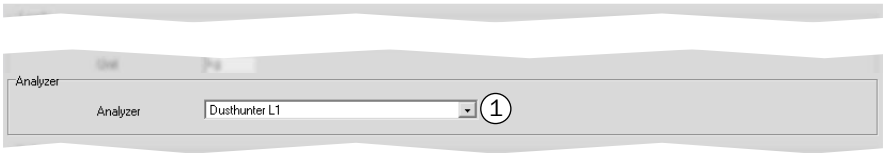
1	▶ *If required:* Take this component into account for the QAL3 evaluation. [1]

[1] Only effective with the software option “QAL3 Master”. *Effect:* As long as status signal “Calibration” or “Check Cycle” is activated for the measured value source (analyzer), the momentary values of the component are saved separately.

3.8.15 Assigning the component to a virtual analyzer (IED)

– Only valid for IED evaluations –

Fig. 33: Configuration Component: Assigning to a virtual analyzer



1	▶ Select the virtual analyzer to acquire this component. [1]

[1] Explanation, see “Structuring unit “Analyzer” (IED)”, page 24.

▶ *When a single measuring system is the source for several “components” of the evaluation:* Only assign one of the “components” which originate from the same source to the virtual analyzer.

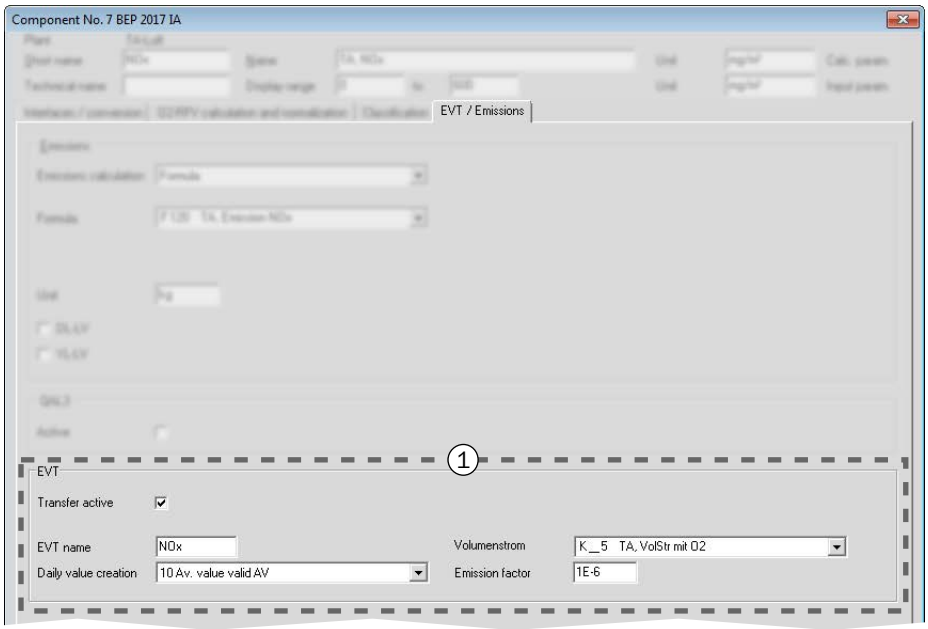
▶ Set the same average time for all “components” assigned to a virtual analyzer (see “Configuring component acquisition”, page 39).

Current data of the virtual analyzer are displayed in the program section “Current” in the counter screen (see “Operating Instructions MEAC300”).

3.8.16 Configuring remote transfer for a component (note)

Only applies for MEAC software with the option “Emission data remote transfer”.

Fig. 34: Configuration *Functions for remote transfer of component data (note)*



1	See “Technical Information MEAC300 Add-ons” → “Emission data remote transfer (ERT)” for a description of these functions.

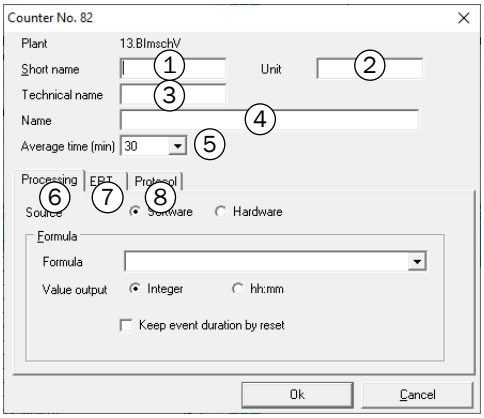
Further information on remote transfer
- see “Configuring the remote transfer for the plant (note)”, page 38
- see “Configuring remote transfer for a counter (note)”, page 63

3.9 Configuring the counters

The counter functions are carried out automatically in 5-second intervals.

3.9.1 Setting up a counter

Fig. 35: Configuration *Setting up a counter*

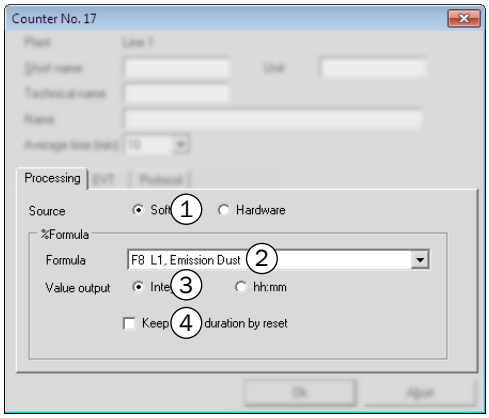


1	▸ Define a short name for the counter.
2	▸ Enter a unit (freely selectable text).
3	▸ *If required:* Enter an alternative identification of the counter (e.g. plant-internal identifier).
4	▸ Enter detailed identification/description of the counter.
5	▸ Define the time interval after which the counter is automatically reset to “zero”.
6	see “Configuring counter events”, page 62
7	see “Configuring remote transfer for a counter (note)”, page 63
8	see “Activating output of the counter level in the Class protocol”, page 63

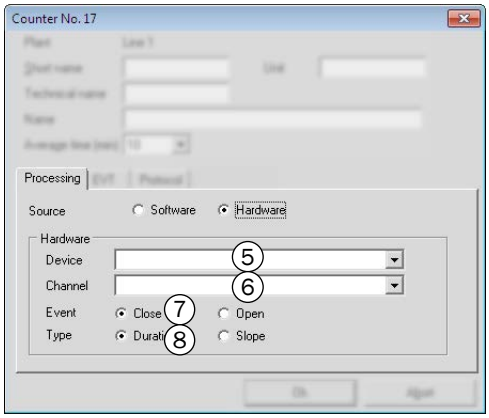
3.9.2 Configuring counter events

Fig. 36: Configuration Configuring counter events

Mode 1



Mode 2



1	▸ Select the control of the counter. – "Software": Counter is controlled by a formula. – "Hardware": Counter is controlled by a digital input.
2	▸ Select the numeric formula from which the result is totaled in the counter. [1]
3	▸ Select the mode for the output value of the counter: – Whole number (integer) – Converted to [hours:minutes] [2]
4	▸ Write the current value of the counter in the Event protocol when the result of the formula is "0".

[1] The formula is recalculated in 5-second intervals. The integer numeric result of the formula is totaled in the counter.
[2] Value "1" corresponds to 5 seconds.

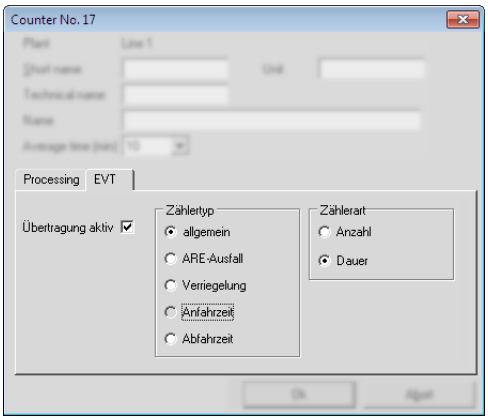
5	▸ Select the device [1] from which the digital input originates.
6	▸ Select the digital input [2] of which the status is to be counted.
7	▸ Select the electronic status to be counted: – The connected switching contact is closed/is being closed – The connected switching contact is open/is being opened.
8	▸ Select what is counted: [3] – Duration of the electronic status. – Changes in the electronic status.

[1] MEAC-internal name (see "Configuring interface and hardware inputs", page 32).
[2] Channel identifier in the MEAC system.
[3] In 5-second intervals.

3.9.3 Configuring remote transfer for a counter (note)

Only applies for MEAC software with the option "Emission data remote transfer".

Fig. 37: Configuration *Functions for remote transfer of counters (note)*

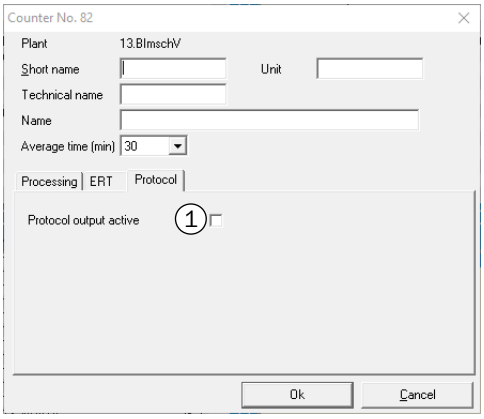


▶ See "Technical Information MEAC300 Add-ons" → "Emission data remote transfer (ERT)" for a description of these functions.

Further functions for the remote transfer
- see "Configuring the remote transfer for the plant (note)", page 38;
- see "Configuring remote transfer for a component (note)", page 60.

3.9.4 Activating output of the counter level in the Class protocol

Fig. 38: Configuration *Activating output of this counter in the Class protocol*



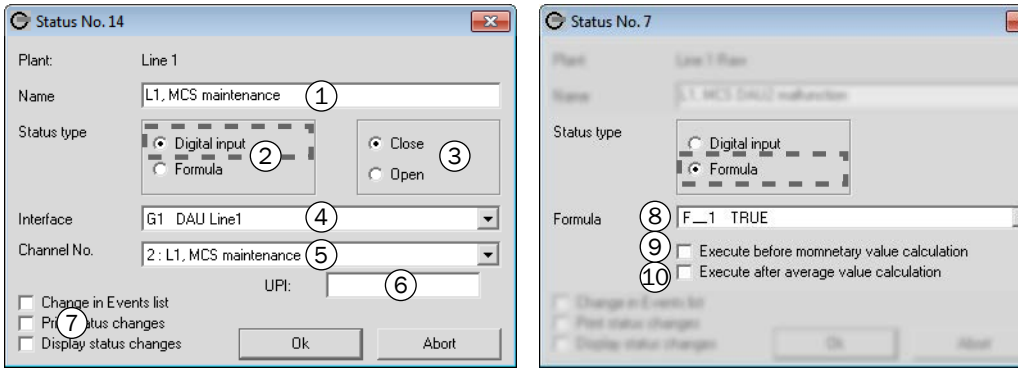
1	▶ Enter the current value of this counter (counter level) in the Class protocol [1].

[1] Data output (see "Operating Instructions MEAC300").

3.10 Defining internal statuses

- Internal statuses can be used at many points of the evaluation configuration to configure logical relations.
- The current result of a formula can also be used as an internal status (see “Programming formulas”, page 66).

Fig. 39: Configuration Internal statuses



1	▸ Select the name of this status. [1]
2	▸ Define how this status is controlled.
3	▸ Set the electronic state which corresponds to the logical state “activated”.
4	▸ Select the device [2] which has the relevant signal input.
5	▸ Select the signal input [2] which receives the relevant signal.
6	▸ *If required:* Enter the UPI identifier for this status.
7	▸ Select where changes of this status also appear. [3]
8	▸ Select the formula giving the result to define this status.
9	▸ Execute this formula before the momentary values have been updated.
10	▸ Execute the formula as soon as a new preliminary average value has been calculated in the current average time.

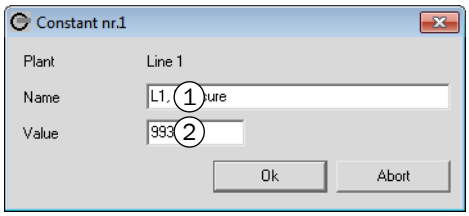
[1] *Recommendation:* Integrate the name of the plant.
[2] MEAC-internal identifier (see “Configuring interface and hardware inputs”, page 32), e.g. for a data acquisition unit.
[3] NOTICE: A change of the setting does not have any effect on past data.

3.11 Defining constants (if required)

Constants can be used in formulas (see “Programming formulas (menu)”, page 67). These then serve as placeholders for a constant numeric value.

Use cases:
- Use a certain value in several formulas.
- Manage individual fixed evaluation parameters at a single point.
- Create understandable formulas.

Fig. 40: Configuration *Constants*



1	▸ Define the name of the constant.
2	▸ Determine the numeric value of the constant.

3.12 Programming formulas

3.12.1 Types of formulas

Formula type:	**Boolean formula**	**Numeric formula**
Usage:	Logical links/branches	Mathematical calculations
Result:	Logical state	Numeric value
Operators:	– Current status – Boolean operands (TRUE/FALSE) – Result of a Boolean formula	– Numeric value from the entry field – Measured value of a component – Classification result – Value of a constant – Time information – Result of a numeric formula

3.12.2 Basic rules for programming formulas

- ▶ Use a point as decimal character.
- ▶ Insert a space between operator and operand.
- ▶ Put the whole expression in round brackets for the Boolean operator "NOT" (*parentheses*).

In conditions (IF–THEN-ELSE):

- ▶ Use a Boolean condition as "IF" criterion.
- ▶ Create the same result type after THEN and ELSE.
- ▶ Always state the ELSE path as well.
- ▶ Finish each condition with END (also in nested conditions).

- All operands can also be used without operators.
- For operands which belong to the configuration, the complete identification is shown in the formula window (move the cursor onto the operand).
- The current result of a Boolean formula can be used as an internal status in other program functions (comparison, see "Defining internal statuses", page 64).

3.12.3 Using formulas in formulas

An operand can also be the result of a formula. The result of the "embedded" formula is then used for this operand.

There are two modes:

– The last (current) result of an embedded formula is used.
– The embedded formula is calculated anew before its result is used.

This method also works with the formula itself. It is therefore possible to use the previous result of this formula in the formula.
For example, this can be useful for time-controlled sequences.

3.12.4 Automatic calculation of formulas

A formula is always calculated anew when it is called by one of the program functions in which the use of this formula is configured:

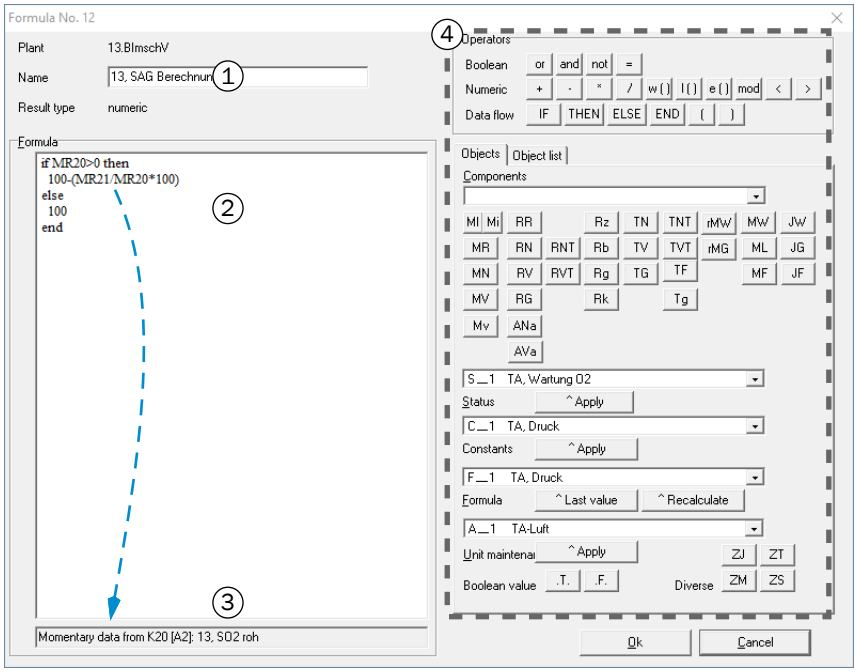
- Component (see “Configuring a component”, page 38)
- Internal status (see “Defining internal statuses”, page 64)
- Digital output (see “Configuring digital outputs”, page 70)
- Numeric output (see “Configuring numeric outputs”, page 72).
- Different formula.

NOTE: Consequences of automatic calculation

- As long as the formula has never been called, the formula result is a random initial value.
  - »» As long as the formula is not calculated, confusing effects might occur in the program sequence.
- A different formula result can occur for each call.
  - »» When a formula is used in several program functions, it is possible that the program functions process different formula results although the same formula is used.

3.12.5 Programming formulas (menu)

Fig. 41: Configuration Formula generator (with example data)



1	► Define the name of the formula.
2	► Edit the formula.
3	Information on the formula operator to which the cursor points.
4	► *To add a formula element to the formula:* – Select component. – Click the relevant button. [1]

[1] Key to symbols, see “Formula operators”, page 68.

NOTE:
Validated average values may not be used for the calculation of emission volumes.

3.12.6 Formula operators

bDev	Connection status of a connected I/O device
f	Previous value of the formula
F	Current value of the formula (formula is calculated anew)
fF	Moisture scaling factor: 100 / [(100 – moisture(component)]
fO	O_2 reference value calculation: 21 – $O_{2(\text{reference value})}$ / (21 – $O_{2(\text{component})}$)
fP	Pressure scaling factor $\text{Pressure}_{\text{component}}$ / 1013 ► *Note:* Use as reciprocal value (1/fP).
fT	Temperature scaling factor: (273 + $\text{Temp}_{\text{component}}$) / 273
.F.	FALSE (Boolean value)
HDD	Currently free memory of the data medium in the PC (hard disk)
JF	Yearly volume so far
JG	Current yearly limit
JW	Current yearly value
KW	Current counter status of an S class
MF	Current monthly volume
Mi	Momentary value: Used input signal (input current)
MI	Momentary value: Input signal of the smaller measuring range
MMW	Monthly value (from average values)
MMV	Validated monthly value (from validated average values)
MG	Monthly limit
MN	Momentary value: Current momentary value after reference value calculation and scaling
MR	Momentary value: Current momentary value (without reference value calculation and scaling)
Mv	Momentary value: Status “valid”
MW	Current monthly value
P	Plant: Status “Function check”
rAV	Floating average value in specified time interval (from valid and invalid values) for calculations outside official Directives
rAVV	As rAV, however only with valid values
Rb	Average value: Present number of momentary values in the active average time [1]
Rg	Average value: Present number of valid momentary values in the active average time
RG	Average value: Current average limit
Rk	Average value: Status of the average time (TRUE = end of average time)
rMG	Current limit value of the rolling monthly value
rMW	Current, rolling monthly value (scaled and validated)
RN	Average value: Current average value during an average time after reference value calculation and scaling
RNa	Average value of all valid and scaled momentary values created during an average time while status signal “compliance operation ” was activated
RNf	Unconditional scaled average value (imaginary value which may not be exceeded during the remaining average time to maintain the average limit)
RNj	Average value: Current average value during an average time after reference value calculation and scaling
RNT	Average value: Current forecast for the scaled average value (extrapolation)
RR	Average value: Current average value during an average time without reference value calculation and scaling
RRa	Average value of all valid and non-scaled momentary values created during an average time while status signal “compliance operation” was activated
RS	Standard deviation of a component
Ru	Average value: Present number of momentary values which were invalid in the active average time
Rv	Average value: Validity status
RV	Average value: Current average value during an average time after reference value calculation, scaling and validation.
RVf	Unconditional validated average value (imaginary value which may not be exceeded during the remaining average time to maintain the average limit)
RVj	Average value: Current average value during an average time after every reference value calculation, scaling and validation
RVT	Average value: Current forecast for the validated average value (extrapolation)
Rz	Average value: Average time in minutes
S	Internal status
TF	Current daily volume

Tg	Daily value: Number of valid average values during the current day
TG	Daily value: Current daily limit
TN	Daily value: Scaled daily value
TNf	Unconditional scaled daily value (imaginary value which may not be exceeded during the rest of the day to maintain the daily limit)
TNT	Daily value: Current forecast for the scaled daily value (extrapolation)
Tu	Daily value: Number of average values which were invalid during the current day
TV	Daily value: Current validated daily value
TVf	Unconditional validated daily value (imaginary value which may not be exceeded during the rest of the day to maintain the daily limit)
TVT	Daily value: Current forecast for the validated daily value (extrapolation)
.T.	TRUE (Boolean value)
ZJ	Number of calendar days of the current year
ZM	Number of expired minutes of the current day
ZS	Current second
ZT	Number of expired calendar days in the current year (without current day)

[1] Rb = Rg + Ru, when status signal “compliance operation” is activated.

When using formula operators that return average or limit values of components as a result, the internal processing order must be observed according to the configured arrangement of the components.
Example:
- A formula with this formula operator is configured to calculate the dynamic limit of a component.
- To ensure the availability of the formula result at the time of the limit comparison, the calling component must be placed after the operand component of the formula.

3.12.7 Formula examples

Name	Contents
NOX	`(37.5 * MI7 - 150) * 1.533`
Dust Range 2	`MI8 > 18.5`

Operation	`S23 and`
	`(`
	`if Mv4 then`
	`MR4 < 16`
	`else`
	`f2`
	`End`
	`)`

Emission SO2	`if RN4 > 11 then`
	`RNa5 * RNa6 / 100000 * (21-RN4)/(21-11)`
	`else`
	`RNa5 * RNa6 / 100000`
	`End`

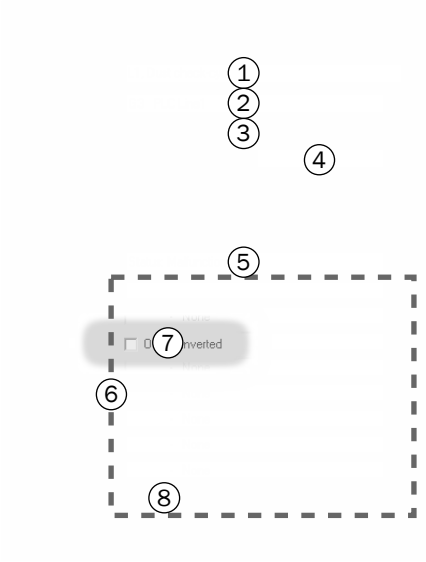
Emission NOX	`if RN4 > 11 then`
	`RNa5 * RNa7 / 100000 * (21-RN4)/(21-11)`
	`else`
	`RNa5 * RNa7 / 100000`
	`End`

3.13 Configuring hardware outputs

3.13.1 Configuring digital outputs

The MEAC program can control the digital outputs according to configurable criteria and conditions. A digital output can, for example, control an output device connected to the emission PC via a data interface.

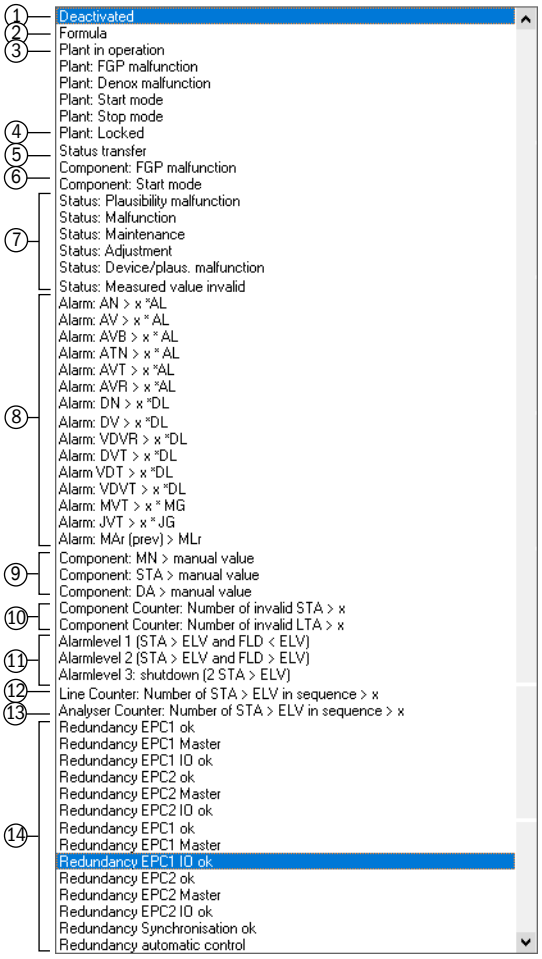
Fig. 42: Configuration *Digital output*



1	▸ Determine the MEAC-internal identification of the digital output. [1]
2	▸ Select the output device. – *To generate a message which only appears in the emission PC but is not output:* ▸ Select “GO” (virtual device).
3	▸ Select the digital output of the output device which should output the message. [2]
4	▸ *If required:* Enter the UPI identifier of the digital output.
5	▸ Select mode (see “Modes for digital outputs”, page 71).
6	▸ Select settings for the selected mode.
7	▸ Invert the switching logic of the digital output.
8	▸ Enter factor “x”.

[1] *Recommendation:* Integrate the name of the plant.
[2] Channel identifier in the MEAC system.

Fig. 43: Configuration *Modes for digital outputs*



1	The output is deactivated.
2	The output is activated when the selected Boolean formula is “TRUE”. ▸ Select the formula.
3	The output is activated when status signal “compliance operation” is activated for the plant. Plant: FPG malfunction: Exhaust gas purification failure Plant: Denox malfunction: Denox failure Plant: Start mode: Starting operation Plant: Stop mode: Stopping operation
4	The output is activated when the relevant status signal is activated for the plant.
5	The output is activated when the selected digital input is activated. ▸ Select the digital input.
6	The output is activated when the relevant status signal is activated for the component. ▸ Select the component.
7	The output is activated when the relevant status signal is activated for at least one of the selected components. [1] ▸ Select the components.
8	The output is activated when the relevant relation [2] is true for at least one of the selected components. ▸ Select the components. ▸ Enter factor “x”. [3]
9	The output is activated when the relevant relation [2] is true for the selected component. ▸ Select the component. ▸ Select the virtual analog input which signals the “manual value”. [4]
10	The output is activated when the number of values which were invalid is greater than the entered limit value for the relevant emission value [2]. ▸ Enter limit value “x”.
11	The output is activated when the relevant alert level is activated. (see “Activating the average value alarm (FNADE)”, page 56).
12	The output is activated when the number of average values which were greater than the average limit without interruption is greater than the limit value entered for the selected plant. ▸ Enter limit value “x”.
13	The output is activated when the number of average values which were invalid without interruption is greater than the limit value entered for the selected virtual analyzer. ▸ Select the virtual analyzer. ▸ Enter limit value “x”.
14	The output is activated when the relevant status of the redundant system is valid. [5]

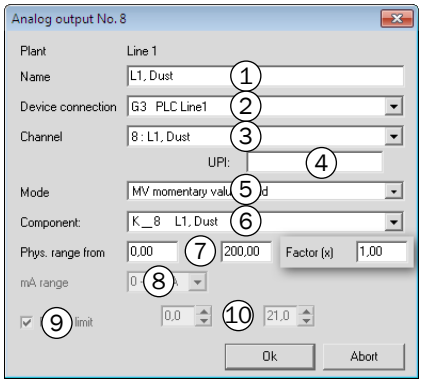
[1] “Calibration” also signals status “Check Cycle”.
[2] Key to symbols, see “Abbreviations (German/English)”, page 8.
[3] Standard value: 1.00 .
[4] Only available when software option “manual input” is installed.
Key to symbols, see “Abbreviations (German/English)”, page 8.
[5] Explanation, see “Technical Information MEAC300 Add-ons”.

3.13.2 Configuring numeric outputs

The emission PC can output saved and calculated values via numeric outputs. The configured values are sent to an output device via a digital interface.

- When the output value is a relation to a reference value, the output range then corresponds to the reference value and the output value corresponds to the numeric relation.
- When the output value is a numeric share of a volume, the output range then corresponds to the total volume and the output value corresponds to the share of the total volume.

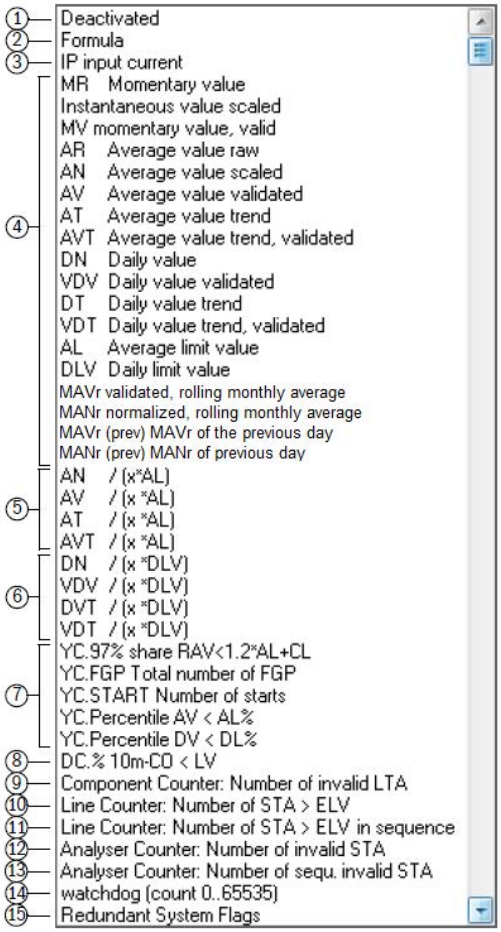
Fig. 44: Configuration *Numeric output*



1	▶ Define the MEAC-internal identification of the numeric output. [1]
2	▶ Select the output device (output device with analog outputs or digital outputs). – *To generate a message which only appears in the emission PC but is not output:* ▶ Select “G0” (virtual device).
3	▶ Select the output of the output device which should output the current emission value (channel identifier in the MEAC system).
4	▶ *If required:* Enter the UPI identifier of the numeric output.
5	▶ Select the desired value of the component (see “Modes for numeric outputs”, page 73).
6	▶ Select component.
7	▶ Enter physical output range. *Or:*
	▶ Enter factor “x”.
8	▶ Select electronic output range. [2]
9	▶ *If required:* Limit electronic signal span. [2]
10	▶ Enter the limits of the electronic signal span. [2]

[1] *Recommendation:* Integrate the name of the plant.
[2] When the output device outputs the output value via an analog output (0 ... 20 mA).

Fig. 45: Configuration *Modes for numeric outputs*



1	The output value is “0”. [1]
2	Select the numeric formula whose result controls the numeric output.
3	The output outputs the current input signal of the selected component.
4	The output outputs the relevant value. [2] ▸ Enter the physical output range.
5	The output outputs the relevant relation of the relevant current average value to the average limit. ▸ Enter factor “x”.
6	The output outputs the relevant relation of the respective current daily value to the daily limit. ▸ Enter factor “x”.
7	The output outputs the share of days of the current calendar year in which the relevant events were true. [3]
8	The output outputs the share of average values of the component “CO 10 minutes” which were not greater than the average limit during the current day.
9	The output outputs the number of days of the current year on which the daily value was invalid.
10	The output outputs the number of average values which were greater than the average limit for the relevant plant in the current calendar year.
11	When a current average value for a relevant plant is greater than the average limit, the output outputs the number of average values which were greater than the average limit without interruption until then.
12	The output outputs the number of average values of the relevant analyzer which were invalid in the current year.
13	When one of the last (current) average values of the relevant analyzer is invalid, the output outputs the number of average values which were invalid without interruption until then.
14	The output outputs a counter value in momentary value cycle.
15	The output outputs a 16-bit word which represents the status of the redundant system (1 bit per status; “1” = the respective status of the redundant system.) [4]

[1] An analog output outputs the electronic zero point.
[2] Key to symbols, see “Abbreviations (German/English)”, page 8.
[3] Only for 13th BImSchV and TI Air.
[4] This mode is not intended for mA outputs.

3.14 Configuring and using data outputs (notes)

• Configuring automatic data output: • Starting desired data displays manually: • Printing desired data:	▶ See “Operating Instructions MEAC300”
• Summarizing desired data for individual reports:	See “Technical Information MEAC300 Add-ons” → “MEx300”
• Using emission data remote transfer :	See “Technical Information MEAC300 Add-ons” → “Emission data remote transfer (ERT)”

4 Activating a new evaluation configuration

4.1 Testing the simulated evaluation configuration

Perform a test run

▶ Test the set simulated evaluation configuration (description, see “Operating Instructions MEAC300”).

NOTE:
The simulated emission data evaluation only runs when the simulated status “Plant in operation” is activated for the plant.

Test simulated conditions

▶ Vary the simulated input conditions.
▶ Check the simulated output signals and output values.
▶ Wait for time sequences to elapse.

Check simulated results

– Are the simulated status outputs correct?
– Are the simulated calculations correct (momentary values, average values, ...)?
– Are the simulated classifications correct?

Activation of the simulated evaluation configuration for the real evaluation, see “Using Simulation mode for configuration (principle)”, page 27.

4.2 Activating the simulated evaluation configuration

When the test of the evaluation configuration was successful:

1 Terminate Simulation mode (Stop function in system window).
2 Activate the simulated evaluation configuration for the real evaluation (see “Using Simulation mode for configuration (principle)”, page 27).

NOTE: Risk of incorrect settings and legal consequences
Incorrect settings in the evaluation configuration can mean the MEAC system no longer functions as intended. Official requirements may not then be met.
▶ Only change the real evaluation configuration when it is ensured that system-specific requirements and individual (local) requirements are met.

5 Information on the Installation program

5.1 Use cases of the Installation program

5.1.1 Overview of installation modes

Usage	Mode	Effect
New installation	MEAC300	The MEAC300 program is installed on the emission PC automatically by the Installation program.
	MEx300	The MEAC300-Add-on “MEx300” is installed.
	SyncService	The MEAC300-Add-on “SyncService” is installed.
Update	MEAC300	The program modules of an installed MEAC300 system are updated.
	MEx300	The program modules of an installed “MEx300” are updated.
	SyncService	The program modules of an installed “SyncService” are updated.
Upgrade		All program modules of an installed MEAC2012 system are updated automatically on MEAC300 by the Installation program. All evaluation configurations are converted automatically.
	Standard mode	The last used evaluation configuration is presented for manual adjustment. [1] The emission data evaluation continues with this evaluation configuration.
	Expert mode	• The evaluation configurations for the current calendar year and the previous calendar year are presented for manual adjustment. [1] • *Optional:* The emission data are evaluated again using the modified evaluation configurations. Newly evaluated emission data are saved automatically in the current database. The emission data evaluation continues with this adjusted, current evaluation configuration.

[1] The manual adjustment can be prepared at an external location (“offline”) (see “External preparation of a MEAC2010 migration”).

5.1.2 External preparation of a MEAC2010 migration

The Installation program can also be used on a copy of a MEAC2012 system stored separately (e.g. on another PC). This allows converting and adjusting the evaluation configurations of an existing MEAC2012 system in advance to MEAC300 at an external location (“offline” preparation). This shortens the upgrade work on the emission PC because the required individual adjustments are already carried out.

A copy (Snapshot) of the respective MEAC2012 installation is sent to Endress+Hauser for this preparation. Endress+Hauser provides the program ExportMeacDaten.exe which supports selection of the relevant data and packing these data in an archive named “Original.Export”.

These data are checked and adjusted by a MEAC expert. The installation program is used offline in this case (function selection: Use Upgrade → Expert mode → Original.Export). When finished, all adjustments and the new evaluated emission data are exported to the “Migration.Export” file. For local upgrades, the Installation program can use these migration data automatically.

5.2 New installation

Prerequisites for new installation

- Emission PC (with operating system installed)
- MEAC300 installation program

Performing new installation

1 Save a copy of the MEAC Installation program on the emission PC.
2 Let the Installation program run.

- The desired MEAC programs can be selected during installation (MEAC300, MEx300, SyncService).
- The Installation program automatically creates the MEAC300 program folder and copies all program modules to this folder.

3 Use the displayed “Software ID” to request the individual license key from Endress+Hauser.

The “Software ID” depends on the individual emission PC and the installed software. The individual license key is generated at Endress+Hauser from the “Software ID”.

4 Enter the individual license key.
5 Configure the MEAC system (see “Configuring the system”, page 26).
6 Check and activate the evaluation configuration (see “Activating a new evaluation configuration”, page 75).

5.3 Update

Prerequisites for an update

- MEAC300 installation program
- Emission PC with functioning MEAC300 Installation (MEAC300 program folder exists).

Performing an update

1 *On all connected workstation PCs (when present):* Terminate the MEAC program.
2 *On the emission PC: Terminate* MEAC300.
3 Save a copy of the MEAC300 Installation program on the emission PC.
4 Start the Installation program.
5 Select installation option “Update”.
6 Wait until the Installation program finishes.

The program modules are only updated when the existing MEAC300 installation is compatible (configuration, data format). Otherwise the Installation program stops.

7 Check that the MEAC300 system is running correctly, e.g.:
  – Program window is shown correctly (see Operating Instructions).
  – Communication paths are functioning (see “Configuring interface and hardware inputs”, page 32).
8 *On all connected workstation PCs (when present):* Restart the MEAC program.

5.4 Upgrade (migration from MEAC2012)

MEAC300 has new and updated evaluation parameters. Therefore, after an upgrade from MEAC2012 to MEAC300, all evaluation configurations that are currently active or were active at least once during the upgrade time frame must be checked and adjusted.

Prerequisites for this upgrade

- MEAC300 installation program
- Functioning MEAC2012 Installation (MEAC2012 program folder) on an emission PC (“Online” upgrade) or on a separate PC (“Offline” preparation)
- *Using prepared migration data:* The “Migration.Export” file in the Installation program folder

License key for MEAC300

The MEAC2012 system license key is not valid for the MEAC300 system. A new license key must be created after the upgrade (see “New installation”, page 77).

Procedure in Upgrade standard mode

- The Installation program modifies all program modules of the MEAC system to MEAC300.
- The Installation program converts all evaluation configurations. If a migration file (“Migration.Export”) is available, all the prepared evaluation configurations from this migration file can be used (selectively).
- The settings of the current evaluation configuration are then presented for checking and manual adjustment.
- As soon as this new evaluation configuration is activated, the emission data evaluation starts completely new (without historic database).

Procedure in Upgrade expert mode

- The Installation program modifies all program modules of the MEAC system to MEAC300.
- The Installation program converts all evaluation configurations. If a migration file (“Migration.Export”) is available, all the prepared evaluation configurations from this migration file can be used (selectively). If the migration file contains recalculated emission data, this data is also transferred and becomes the current database of the MEAC system.
- A list of the evaluation configurations is then displayed. There, those evaluation configurations used in the current and previous calendar year can be selected for manual adjustment.

Edited (adapted) evaluation configurations are marked in the list. This also applies to evaluation configurations transferred from a migration file.

- *Selectively:* The emission data of the current and previous calendar year are recalculated with the new evaluation configurations. The recalculated emission data become the current database of the MEAC system.

Technical notes on the upgrade procedure

- The Installation program automatically checks the compatibility with the existing MEAC installation.
- The previous MEAC program folder is renamed “<MEAC program folder>.MEAC2012”. This provides a complete backup of the previous MEAC2012 installation.
- The Installation program creates a new MEAC program folder with the name of the previous MEAC program folder and copies all necessary files from the backup to it.
- Then the program modules are updated in the new MEAC program folder.
- The data format of the evaluation configurations is converted automatically.

Necessary measure on workstation PCs after the upgrade

On the connected workstation PCs, the start link to the MEAC program (Windows link or execution command in a Batch file) is modified so that it points to the file “shell.exe” in the MEAC program folder of the emission PC.

6 Appendix

6.1 Status identifier acc. to German Directives (BEP/SKK)

Some of the specifications for German Directives are also used for other Directives.

6.1.1 Status identifiers of the momentary values

Character	Significance	Priority
W	Invalid due to maintenance	1
S	Invalid due to malfunction	2
X	No measuring signal	3
M	Measuring range exceeded, valid	4
G	Valid	5

- The status identification of the momentary values is derived from the presence of measurement signals and the measured value/instrument related status data.
- In the MEAC300, these status signals are registered at the end of the 5-second interval. If several of these status signals were activated, the character with the highest priority is used.

6.1.2 Status identifiers of average values

Determination

The status of an average value is valid for the respective average time. Used for determination:

- Status of the momentary values in the respective average time
- Plant status signals in this average time

Official Directives for status identifiers

BEP specifies that all average values are saved with three status identifiers. In addition, an identification number for the status of the plant operating mode must be saved.

Status identifiers, rules and examples for status identification numbers, see document "SKK Plant 1" (Version 2017-11-20).

1st character ("Plant status"): Rating of the plant

G	Plant in compliance operation [1]
X	Plant not in operation (not subject to monitoring)
U	Unclear operating state

[1] Applies if at least one momentary value was generated during the average time while status signal "compliance operation" was activated.

2nd character ("Measured value status 1"): Rating of average value

Character	Significance	Priority	
		≥ 2/3	< 2/3
N	Not subject to compliance	1	–
K	Valid, subject to compliance, outside of "valid calibration range"	2	–
E	Valid, subject to compliance, calculated with default value for reference variable	3	–
G	Valid, subject to compliance	4	–
S	Invalid due to malfunction of measuring system, subject to compliance	5	1 [1]
W	Invalid due to maintenance of measuring system, subject to compliance	6	2 [1]
U	Invalid due to unclear state (not automatically identifiable)	7	–
I	Invalid for other reasons	8	3

[1] Status "S" or "W" only assigned when ≥ 2/3 "plant in compliance operation".

3rd character {"Measured value status 2"): Operating mode

Character	Significance	Priority	
		≥ 2/3	< 2/3
A	Start-up/Shutdown or Start-up operation/Shutdown operation	1	1
N	Average value not subject to compliance	2	–
R	FGP failure, average value subject to compliance	3	–
B	Normal operation	4	2
X	No details/unclear	5	–

- To determine "Measured value status 1" and "Measured value status 2" for system status "G", the status during the time the plant is in compliance operation is used.
- "Measured value status 1" is automatically set to "I" when the total time of these momentary values is shorter than two thirds of the average time.

4th character ("Plant operating mode"): Identification of the "special operating mode"

No.	Significance [1]	*Example*
0	Operating mode or operating state unclear [2]	
1	Plant not in operation (not in compliance operation) [3]	
2	Normal operation (compliance operation)	Coal operation
3	Start-up (not in compliance operation)	Oil burner operation
4	Start-up operation (compliance operation)	Stabilization phase
5	Shutdown operation (compliance operation)	
6	Shutdown (not in compliance operation)	Warming operation
...	*(Further operating modes)*	

[1] Standard specifications in MEAC300.
[2] This means that none of the other operating modes could be assigned.
[3] *In MEAC300:* Status signal "compliance operation" was not active.

6.1.3 Status identifiers of long-term mean values

Character	Significance
G	Valid, availability maintained
V	Valid, availability not maintained [1]
U	Invalid, availability not maintained
F	Invalid, availability maintained [1]

[1] Not used when the availability does not need to be monitored.

- The status identifier for daily and monthly values is created from:
  - Share of valid and invalid average values in the averaging period
  - Number of average values invalid due to "malfunction" or "maintenance"
- The status identifier is created from:
  - Share of valid daily values;
  - Number of daily values with status "Availability not maintained".

6.2 Standard classes

6.2.1 Standard classes for average values

Class [1]	Contents	IED		BImSchV							TI Air
		Power	Waste	1.	2.	13.	17.	27.	30.	31.	
M1	Number of average values which were not greater than the average limit	–	–	●	–	–	–	–	–		–
M1 : M20	Number of average values which were within a certain value range [2] [3]	●	●	–	●	●	●	●	●	●	●
S1	Number of average values which were greater than the average limit	●	●	●	●	●	●	●	●	●	●
S2	Number of average values for which the proportion of momentary values that were both valid and subject to compliance during the average period is lower than the configured minimum share [4], but however without average values counted in classes S4, S5, S7 and S8.	●	●	–	●	●	●	●	●	●	●
S3	Number of average values for which a default value was used for the reference value calculation [5]	●	●	–	●	●	●	●	●	●	●
S4	Number of average values which were generated while status signal “Malfunction” was activated [6]	●	●	–	●	●	●	●	●	●	●
S5	As for S4, but for status “Maintenance”	●	●	–	●	●	●	●	●	●	●
S6	Number of average values generated while status signal “compliance operation” was activated [3]	●	●	●	●	●	●	●	●	●	●
S7	Number of average values for which the share of momentary values that were simultaneously valid and subject to compliance is lower than the configured minimum proportion [4] due to changes in status signal “compliance operation”	●	●	–	●	●	●	●	●	●	●
S8	Number of average values not subject to compliance or not plausible (e.g. because of PC malfunction)	●	●	–	●	●	●	●	●	●	●
S9	Number of valid average values which were outside the “valid calibration range” [7] within one week	●	●	–	●	●	●	●	●	●	●
S10	Evaluated weekly count of valid average values which were outside the “valid calibration range” [7]	●	●	–	●	●	●	●	●	●	●
S11	Number of average values for which the share of momentary values subject to compliance during the average period while status signal “Flue gas purification unit failed” was activated is greater than the configured minimum share [4]	●	●	–	●	●	●	●	●	●	●
S12	Number of average values subject to compliance generated while status signal “Flue gas purification unit failed” was last activated without interruption	●	●	–	–	●	●	–	●		–
S13	Number of average values subject to compliance generated in the past 365 days while status signal “Flue gas purification unit failed” was activated	●	–	–	–	●	–	–	–		–
S14	Number of valid average values created while status “Start-up operation” or “Shutdown operation” was activated and which were greater than the average limit [5]	●	–	–	–	●	–	–	–		●
S15	Number of valid average values for dust created while status signal “Flue gas purification unit failed” was activated and which were not greater than the average limit	–	●	–	–	–	●	–	–		–
S16	As for S15, but for valid average values which were greater than the average limit	–	●	–	–	–	●	–	–		–
S17	Number of valid average values created while status “Start-up operation” or “Shutdown operation” was activated and which were greater than the average limit *(alternative to S1)*	●	●	–	–	–	● [8]	–	–	–	●
S0	Number of average values created while status signal “compliance operation” was not activated	●	●	–	●	●	●	●	●	●	●

[1] In accordance with “Bundeseinheitliche Praxis bei der Überwachung der Emissionen” (“Uniform practice in monitoring emissions”).
[2] Structure: 20 equidistant value ranges between zero and average limit.
[3] Detailed information, see “M classes”, page 20.
[4] see “Setting BEP evaluation parameters”, page 35/see “Setting IED evaluation parameters”, page 37
[5] Not for soot value (see “Classes for soot value”, page 87).
[6] This status normally relates to the measuring system.
[7] Explanation, see “Valid calibration range”, page 21.
[8] Only for “Start-up operation”.

6.2.2 Standard classes for daily values

Class [1]	Contents	IED		BImSchV							TI Air
		Power	Waste	1.	2.	13.	17.	27.	30.	31.	
T1 : T10	Number of valid daily values within a certain value range [2]	●	●	–	●	●	●	–	●	●	●
TS1	Number of valid daily values which were greater than the daily limit	●	●	●	●	●	●	–	●	●	●
TS2	Number of days on which no valid daily value could be created because the share of average values that were valid and subject to compliance was less than 25% on the day (corresponds to < 6 hours/day)	●	●	–	●	●	●	–	●	●	●
TS3	Number of daily values where more than 5 or 6 average values were not valid due to “malfunction” or “maintenance” of the automatic measuring system	●	●	–	–	●	●	–	–	–	–

[1] In accordance with “Bundeseinheitliche Praxis bei der Überwachung der Emissionen” (2017) (“Uniform practice in monitoring emissions”).
[2] Structure: 10 equidistant value ranges between zero and daily limit.

6.3 Special classes

6.3.1 Classes for Directive 2010/75/EU (IED)

Classes for “IED Power”

Class	Numeric contents of class (meter level) for the component concerned
MM1	Number of months in the current year in which the monthly value was not greater than the monthly limit. [1]
MMS1	Number of months in the current year in which the monthly value was greater than the monthly limit. [1]
J1	Percentage share of the year of the validated average values that were not greater than the special average limit [2]
JS1	– “0”, when at least 95% of the average values in the current year were not greater than the special average limit. [2] – “1”, when more than 95% of the average values in the current year were greater than the special average limit. [2]

[1] Is acquired at the end of each month.
[2] During comparison, the validated average values are mathematically rounded in accordance with official regulations.

Classes for “IED Waste”

Class	Numeric contents of class (meter level) for the component concerned
J1	Percentage share of the year of the validated average values that were not greater than the special average limit [1]
	Not applicable for components that are evaluated in classification mode “CO-30-minutes” (see “Classes for “CO-10/30-minutes” average values”).
JS1	– “0”, when at least 97% of the average values in the current year were not greater than the special limit value. [1] – “1”, when more than 97% of the average values in the current year were greater than the special limit value. [1]

[1] During comparison, the validated average values are mathematically rounded in accordance with official regulations.

6.3.2 Classes for carbon monoxide emissions

Classes for “CO-10/30-minutes” average values

Class	Numeric contents of class (meter level) for the component concerned
M1	As for standard classes (see “Standard classes”, page 83) [1]
S1	
S3	
⋮	
S12	
J1	*Only for components that are evaluated in classification mode “CO-30-minutes”:* Percentage share of the year of the validated daily values that were not greater than the special daily limit [2]
T1	*Only for components that are evaluated in classification mode “CO-10-minutes”:* – “0”, when the share of average values that were not greater than the average limit during the current day is lower than the specified daily share [2] – “1”, when the share of average values that are not greater than the average limit during the current day is at least as high as the specified daily share [2]
TS1	*Only for components that are evaluated in classification mode “CO-10-minutes”:* Inverse function of “T1”

[1] Average time = 10 minutes.
[2] see “Classifications for 17th BImSchV/IED Waste/FNADE: Overview”, page 48 [5].

6.3.3 Classes for dusty emissions

Classes for “Dust qualitative” – TI Air/13th BImSchV/27th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
F1 (M1 ... M20)	Number of average values where no momentary value was greater than the alarm threshold
FS1 (S1)	Number of average values where at least one momentary value was greater than the alarm threshold
FS2	As for standard class S2 (see “Standard classes”, page 83)
FS4	As for standard classes S4 ... S8 (see “Standard classes”, page 83)
¦	
FS8	
FS11	As for standard class S11
FS0	As for standard class S0
FSÜ	Total of times during which the momentary values of the component were greater than the associated alarm threshold (format: *h:mm:ss*; increment: 5 seconds)

Classes for “Dust quantitative” – 27th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
F1 (M1 ... M20)	Number of average values which were not greater than the average limit
FS1 (S1)	Number of average values which were greater than the average limit
FS2	As for standard classes S2 ... S8 (see “Standard classes”, page 83)
¦	
FS8	
FS11	As for standard class S11
FS0	As for standard class S0
FSÜ	Total time during the classification interval in which the average value was greater than the average limit (overflow duration, format: h)

6.3.4 Classes for soot value

Classes for “1-minute soot value” – 1st BImSchV

Class	Numeric contents of class (meter level) for the component concerned
M1	As for standard classes (see “Standard classes”, page 83)
S1	
S6	

Classes for “1-minute soot value” – TI Air

Class	Numeric contents of class (meter level) for the component concerned
M1	As for standard classes (see “Standard classes”, page 83)
S1	
S2	
S4	
¦	
S8	

Classes for “3-minute soot value” – TI Air/1st BImSchV/13th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
M1	As for standard classes (see “Standard classes”, page 83)
¦	
M20	
S1	
S2	
S4	
¦	
S8	
S0	
T1	
¦	
T10	
TS1	
TS2	

Classes for “30-minute soot value” – 13th BImSchV

Identical with “Classes for “3-minute soot value” – TI Air/1st BImSchV/13th BImSchV”.

6.3.5 Classes for plant values

Classes for sulfur separation rate: Average value [%] – TI Air/13th BImSchV/ 17th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
M1	Number of average values that were in a certain sub-range between 100% of the sulfur separation rate and the average limit of the sulfur separation rate (counted in descending order of importance). *Structure:* 20 equidistant sub-ranges between 100% of the sulfur separation rate (= start value for class M1) and the average limit of the sulfur separation rate (= end value for class M20). [1]
⋮	
M20	
S1	Number of average values which were lower than the average limit of the sulfur separation rate
S2	As for standard classes [2]
⋮	
S13	
S14[3]	Number of average values which were lower than the average limit of the sulfur separation rate while status “Start-up operation” or “Shutdown operation” was activated
S17[4]	
S0	As for standard class S0 [2]
T1	Number of days on which the sulfur separation rate was not lower than the average limit of the sulfur separation rate (as for standard classes [2], but counted in descending order of importance)
⋮	
T10	
TS1	Number of days on which the sulfur separation rate was lower than the daily limit of the sulfur separation rate
TS2	As for standard classes [2]
TS3	

[1] This structure deviates from the normal M classes (-see “M classes”, page 20).
[2] see “Standard classes”, page 83.
[3] Only for TI Air and 13th BImSchV.
[4] Only for TI Air and 17th BImSchV.

Classes for sulfur separation rate: Daily limit [%] – TI Air/13th BImSchV/17th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
TS2	Number of days on which the daily value of the sulfur separation rate could not be created
TS3	Number of daily values of which more than 5 or 6 average values were not valid
TS4	Number of days on which the sulfur separation rate was not lower than the daily limit of the sulfur separation rate
TS5	Number of days on which the sulfur separation rate was lower than the daily limit of the sulfur separation rate

Classes for sulfur emission rate: Daily limit [%] – TI Air/13th BImSchV/17th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
TS2	Number of days on which the daily value of the sulfur emission rate could not be created
TS3	Number of daily values of which more than 5 or 6 average values were not valid
TS4	Number of days on which the sulfur emission rate was not greater than the daily limit of the sulfur emission rate
TS5	Number of days on which the sulfur emission rate was greater than the daily limit of the sulfur emission rate

Classes for temperature in the post combustion zone – 17th BImSchV

Class	Numeric contents of class (meter level) for the component concerned
TAZ1	Number of average values of temperature which were in a certain value range in which the minimum temperature was maintained [1]
⋮	
TAZ10	
TAZ11	Number of average values of temperature which were in a certain value range below the minimum temperature [2]
⋮	
TAZ20	
TAZ21	Number of average values of temperature which were created while status signal “Malfunction” or “Maintenance” was activated for temperature measurement
S2	As for standard class S2 [3]
S4	As for standard classes S4 ... S8 [3]
⋮	
S8	
S17	As for standard class S17 [3]
S0	As for standard class S0 [3]

[1] Structure: 10 equidistant value ranges in the range [average limit + 200 °C] to [average limit].
[2] Structure: 10 equidistant value ranges in the range [average limit] to [average limit – 200 °C].
[3] see “Standard classes”, page 83.

Classes for temperature in the post combustion zone – 27th BImSchV (standard)

Class	Numeric contents of class (meter level) for the component concerned
TNBZ1	Number of average values of temperature which were not lower than the minimum temperature
TNBZ2	Number of average values of temperature which were lower than the minimum temperature
TNBZ3	Number of average values of temperature which were created while status signal “Malfunction” or “Maintenance” was activated for temperature measurement
TNBZU	Total time (duration) during the classification interval where the average value of temperature was lower than the minimum temperature (duration of underflow) [1]
S2	As for standard class S2 [2]
S4	As for standard classes S4 ... S8 [2]
⋮	
S8	
S0	As for standard class S0 [2]

[1] Increment: 10 minutes.
[2] see “Standard classes”, page 83.

Classes for temperature in the post combustion zone – 27th BImSchV “alternative”

Class	Numeric contents of class (meter level) for the component concerned
TAZ1	Number of average values of temperature which were in a certain value range in which the minimum temperature was maintained [1]
⋮	
TAZ10	
TAZ11	Number of average values of temperature which were in a certain value range below the minimum temperature [2]
⋮	
TAZ20	
TAZ21	Number of average values of temperature which were created while status signal “Malfunction” or “Maintenance” was activated for temperature measurement
TAZU	Total time (duration) during the classification interval where the average value of temperature was lower than the minimum temperature (duration of underflow) [3]
S2	As for standard class S2 [4]
S4	As for standard classes S4 ... S8 [3]
⋮	
S8	
S0	As for standard class S0 [3]

[1] Structure: 10 equidistant value ranges in the range [average limit + 200 °C] to [average limit].
[2] Structure: 10 equidistant value ranges in the range [average limit] to [average limit – 200 °C].
[3] Increment: 10 minutes.
[4] see “Standard classes”, page 83.

6.4 Evaluation configuration example (print output)

Fig. 46: Evaluation configuration printout - Example page 1

28.08.2022
Softwareversion 4.2.0.13

Anlagenmodell 13.BImschV

Neue Konfiguration 1.0, letzte Änderung: 26.08.2022 14:52

Anlagen-Id	**A_2**
Kurzbezeichnung	**13**
Bezeichnung	**13.BImschV**
Richtlinie	**BEP 2017 13.BlmSchV**

Rasterwerte (RW)

gültig ab (%) gültiger und beurteilungs-pflichtiger Momentanwerte	66,67 % der Integrationszeit
Max. ARE-Ausfallzeit im Jahr [Std]	120
Max. ARE-Ausfallzeit zusammenhängend [Std]	24

Langzeitmittelwerte (TW,MMW,JW)

Max. Anzahl wegen Störung/Wartung ungültiger RW zur Einhaltung der Verfügbarkeit am Tag	6
Max. Anzahl Tage im Jahr, an denen die Verfügbarkeit nicht eingehalten war	10
Berichtsausgabe gleitender Monatswert (MMWg)	Ja

Anlagenstatus

überwachungspflichtiger Betrieb	S_22 : 13, Überwachungpflichtig

Betriebsarten

BA_1 Außer Betrieb
BA_2 Gas Betrieb
BA_3 Anfahren
BA_4 Anfahrbetrieb
BA_5 Abfahrbetrieb
BA_6 Abfahren
BA_7 spezieller Betrieb
BA_8 Öl Betrieb
BA_9 Misch Betrieb

Emissions-Fernübertragung

Werte über EFÜ übertragen	Ja
EFÜ-Bezeichnung	13
PCX-Datei	keine

EFÜ-Aktionen

Anruf an das G-System	Ja
Aufnahme in das Archiv	Ja

Fig. 47: Evaluation configuration printout - Example page 2

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Anlagenmodell TA-Luft

Neue Konfiguration 1.0, letzte Änderung: 26.08.2022 14:52

Konstanten

ID	Bezeichnung	Wert
C__1	TA, Druck	1000
C_22	TA, Umrechnngsfaktor mg --> g	1000
C_23	TA, Cges StdAbw	0,6
C_24	TA, Staub StdAbw	0,6

Fig. 48: Evaluation configuration printout - Example page 3

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Anlagenmodell TA-Luft

Neue Konfiguration 1.0, letzte Änderung: 26.08.2022 14:52

Formeln

ID	Bezeichnung	Formel
F__1	TA, Druck	C1
F__2	TA, BA "In Betrieb"	S11
F__3	TA, BA "ausser Betrieb"	not S11
F__4	TA, nicht beurteilungspflichtig	S10
F_82	TA, BA Normalbetrieb	S11 and (not S10) and (not S9) and (not S73)
F_83	TA, BA Anfahren	S11 and S10 and S9 and (not S73)
F_84	TA, BA Anfahrbetrieb	S11 and (not S10) and S9 and (not S73)
F_85	TA, BA Abfahrbetrieb	S11 and (not S10) and (not S9) and S73
F_86	TA, BA Abfahren	S11 and S10 and (not S9) and S73
F_87	TA, BA spezieller Betrieb	S11 and S10 and (not S9) and (not S73)
F103	TA, MBU2 SO2 (Hysterese 19,5 mA)	(MI9 > 19.5) and (not S7)
F132	TA, MR Massenstrom Cges	MR10*MR5/C22
F133	TA, RV Massenstrom Cges	RV10*RN5/C22
F134	TA, MR Massenstrom Staub	MR11*MR5/C22
F135	TA, RV Massenstrom Staub	RV11*RN5/C22
F136	TA, MV Massenstrom Cges	(MN10-C23)*MN5/C22
F137	TA, MV Massenstrom Staub	(MN11-C24)*MN5/C22

Fig. 49: Evaluation configuration printout - Example page 4

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Anlagenmodell TA-Luft

Neue Konfiguration 1.0, letzte Änderung: 26.08.2022 14:52

Status

ID	Bezeichnung	Quelle		Kanal-Nr	Kanalbezeichnung	Öffner/ Schliesser
S__1	TA, Wartung O2	Schnittstelle1		9	Wartung O2	Schl.
S__2	TA, Störung O2	Schnittstelle1		10	Störung O2	Schl.
S__3	TA, Wartung Multi	Schnittstelle1		7	Wartung Multi	Schl.
S__4	TA, Störung Multi	Schnittstelle1		8	Störung Multi	Schl.
S__5	TA, Wartung SO2 roh	Schnittstelle1		11	Wartung SO2 roh	Schl.
S__6	TA, Störung SO2 roh	Schnittstelle1		12	Störung SO2 roh	Schl.
S__7	TA, MBU3 SO2	Schnittstelle1		6	MBU3 SO2	Schl.
S__8	TA, ARE Ausfall	Schnittstelle1		5	ARE Ausfall	Schl.
S__9	TA, Anfahren	Schnittstelle1		3	Anfahren	Schl.
S_10	TA, nicht Beurteilungspflichtig	Schnittstelle1		2	Klassierunterdrückung n.	Schl..
S_11	TA, Überwachungpflichtig	Schnittstelle1		1	in Betrieb	Schl.
S_62	TA, Wartung Staub	Schnittstelle1		15	Wartung Staub	Schl.
S_63	TA, Störung Staub	Schnittstelle1		16	Störung Staub	Schl.
S_73	TA, Abfahren	Schnittstelle1		4	Abfahren	Schl.
S_74	TA, BA Normalbetrieb	Formel	82			v.MR
S_75	TA, BA Anfahren	Formel	83			v.MR
S_76	TA, BA Anfahrbetrieb	Formel	84			v.MR
S_77	TA, BA Abfahrbetrieb	Formel	85			v.MR
S_78	TA, BA Abfahren	Formel	86			v.MR
S_79	TA, BA spezieller Betrieb	Formel	87			v.MR
S102	TA, MBU2 SO2	Formel	103			n.MR

Fig. 50: Evaluation configuration printout - Example page 5

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Anlagenmodell TA-Luft

Neue Konfiguration 1.0, letzte Änderung: 26.08.2022 14:52

Komponenten

ID	Bezeichnung	Typ	Quelle	Kanal-Nr	Kanalbezeichnung
K__1	TA, O2	1 Kanal	1 DAE	14	O2
K__2	TA, Temp	1 Kanal	1 DAE	15	Temp.
K__3	TA, Feuchte	1 Kanal	1 DAE	16	Feuchte
K__4	TA, Druck	1 Kanal	1 DAE	17	Druck
K__5	TA, VolStr mit O2	1 Kanal	1 DAE	18	VolStr
K_92	TA, VolStr ohne O2	1 Kanal	1 DAE	18	VolStr
K__6	TA, CO	1 Kanal	1 DAE	1	CO
K__7	TA, NOx	1 Kanal	1 DAE	2	NOx
K__9	TA, SO2	2 Kanäle	1 DAE	3	SO2
			1 DAE	4	SO2 MB2
K_10	TA, Cges	1 Kanal	1 DAE	6	Cges
K101	TA, Cges Massenstrom	Virtuell			
K_11	TA, Staub	1 Kanal	1 DAE	8	Staub
K102	TA, Massenstrom Staub	Virtuell			
K_90	TA, Staub qualitativ	1 Kanal	1 DAE	8	Staub
K_12	TA, RZ	1 Kanal	1 DAE	13	RZ

Fig. 51: Evaluation configuration printout - Example page 6

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Anlagenmodell TA-Luft

Neue Konfiguration 1.0, letzte Änderung: 26.08.2022 14:52

Komponente: K__7 TA, NOx

Komponente

Bezeichnung	TA, NOx	Integr.Zeit (min)	30 min
techn.Bez.	-	Anzeigebereich	0,00 - 600,00 mg/m³
Ersatzwert	-	Anzeigekommastellen	2
Jahreswert (JW)	auf TW-Basis	Gültiger Kalibrierbereich	-
		Zeitbasis	S6 Wochenzeit

TW gültig ab [%] gültiger RW	25,00 %
MMWg gültig ab [%] gültiger RW	25,00 %
MMW gültig ab [%] gültiger RW	25,00 %
JW gültig ab [%] gültiger RW bzw. TW	25,00 %

Quelle Kanal 1

Gerät	G1 EP-Labor
Kanal	k002 NOx
Plausibilität	3,68 - 30,00 mA
Modus	1 Kanal
Status MBU	-

Umrechnung

Nr.	Regressionauswahl	Formel/ a	b	c	Std.Abw.
1.		-150	37,5	0	6

Status Kanal 1

Störung	S__4 TA, Störung Multi
Wartung	S__3 TA, Wartung Multi
Justierung	-

O2-BZW-Rechnung und Normierung

Nur für Statuskennung	Nein		
Modus	Konstant		
Bezugswert O2	11,00	RN:=Mittelwert(MN)	Nein
O2-Meßwert	K__1 (O2)	Korrektur MN	-
Temperatur	K__2 (Temp)	Korrektur RN	-
Feuchte	K__3 (Feuchte)	Korrektur RV	-
Druck	K__4 (Druck)		
RN >= 0.0	Ja	Korrektur RNj	-
MN >= 0.0	Nein	Korrektur RVj	-

Klassierung

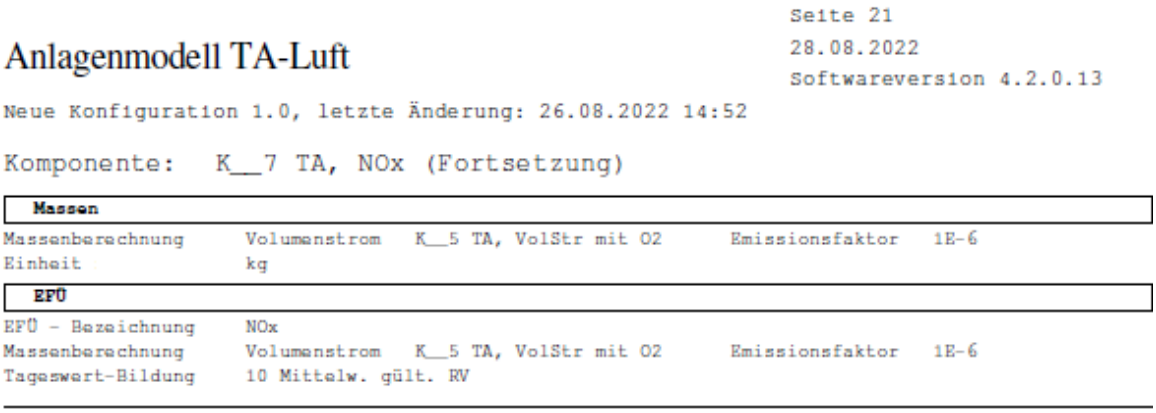
Modus	Konstant		
RG	100,00		
		TG	50,00
MGg	-	MG	-
JG	-		
Validierung	Absolut		

Sonderklassen

ARE-Ausfall *S__8 TA, ARE Ausfall* *gültig ab 10,00% für Rasterwert*

Überwachungspfl. Betrieb Betriebsart Nr.	Statussignal für Momentanwert	nicht beurteilungspfl.	gültig ab [%] für Rasterwert	Klassierung RW > RG
BA_2 Normalbetrieb	S_74 TA, BA Normalbetrieb	-	66,67	
BA_3 Anfahren	S_75 TA, BA Anfahren	MW	66,67	
BA_4 Anfahrbetrieb	S_76 TA, BA Anfahrbetrieb	-	66,67	S14
BA_5 Abfahrbetrieb	S_77 TA, BA Abfahrbetrieb	-	66,67	S14
BA_6 Abfahren	S_78 TA, BA Abfahren	MW	66,67	
BA_7 spezieller Betrieb	S_79 TA, BA spezieller Betrieb	MW	66,67	

Fig. 52: Evaluation configuration printout – Example Page 6, (2. Part)



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Anlagenmodell TA-Luft

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Komponente: K__7 TA, NOx (Fortsetzung)

Massen				
Massenberechnung	Volumenstrom	K__5 TA, VolStr mit O2	Emissionsfaktor	1E-6
Einheit	kg			
EFÜ				
EFÜ - Bezeichnung	NOx			
Massenberechnung	Volumenstrom	K__5 TA, VolStr mit O2	Emissionsfaktor	1E-6
Tageswert-Bildung	10 Mittelw. gült. RV			

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