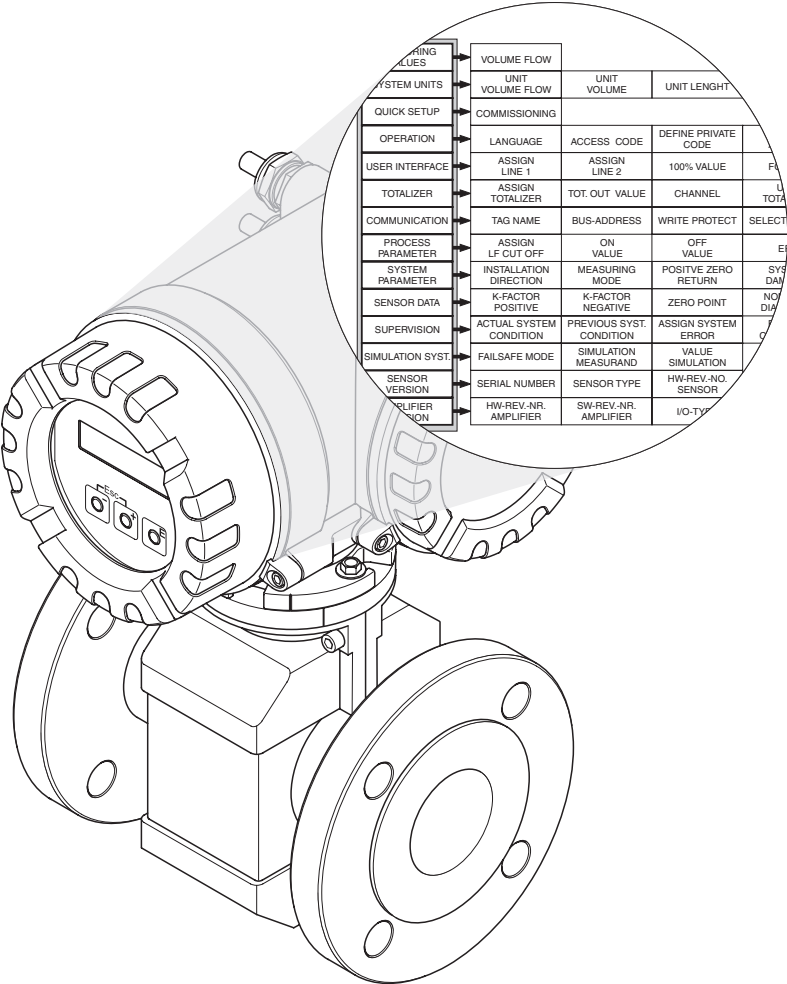


valid as of software version:
V 1.01.XX (amplifier)
V 1.00.XX (communication)

promag 50 *(PROFIBUS-PA)* **Electromagnetic Flow Measuring System**

Description of Device Functions



Operation Promag 50 PROFIBUS-PA

- with local operation: see Page 5**
- with PROFIBUS-PA: see Page 35**

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PROFIBUS®

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S-DAT™

Registered trademark of Endress+Hauser Flowtec AG

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1 Function matrix

1.1 The function matrix: layout and use

The function matrix is a two-level construct: the groups form one level, functions the other. The groups are the highest-level grouping of the control options for the measuring device.

Each group comprises a number of functions.

You select a group in order to access the individual functions for controlling or parameterising the measuring device.

You will find an overview of the groups in the table of contents on Page 3 and in the graphical representation of the function matrix on Page 8.

You will also find an overview of the functions on Page 8, complete with the page references of the detailed function descriptions.

The descriptions of the individual functions start on Page 9.

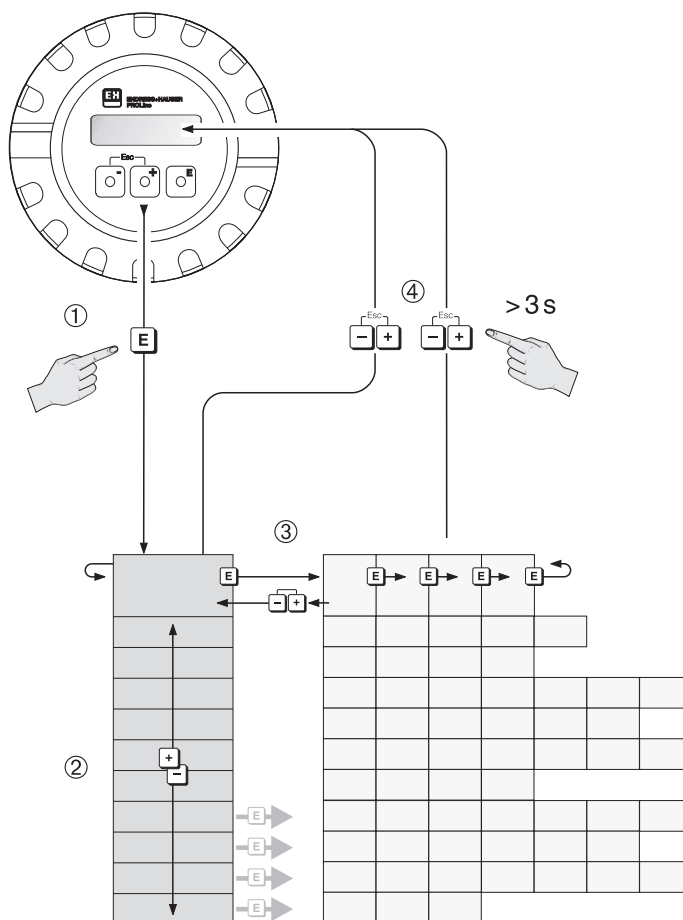
Example of how to parameterise a function (in this case changing the language for the user interface):

① Entry into the function matrix (E key).

② Select the OPERATION group.

③ Select the LANGUAGE function, change the setting from ENGLISH to DEUTSCH and save (E) (all texts displayed on the user interface appear in German).

④ Exit the function matrix (ESC > 3 seconds).



1.2 Overview of the function matrix

MEASURING VALUES (Page 9)	VOLUME FLOW (Page 9)																
SYSTEM UNITS (Page 10)	UNIT VOL. FLOW (Page 10)		UNIT VOLUME (Page 10)		UNIT LENGTH (Page 10)												
QUICK SETUP (Page 11)	SETUP COM. (Page 11)																
OPERATION (Page 12)	LANGUAGE (Page 12)		ACCESS CODE (Page 12)		DEF. PRIV. CODE (Page 12)		STATUS ACCESS (Page 12)										
USER INTERFACE (Page 13)	ASSIGN LINE 1 (Page 13)		ASSIGN LINE 2 (Page 13)		100% VALUE (Page 13)		FORMAT (Page 14)		DISPLAY DAMPING (Page 14)		CONTRAST LCD (Page 14)	TEST DISPLAY (Page 14)					
TOTALIZERS (Page 15)	SELECT TOTALIZER (Page 15)		TOT. OUT VALUE (Page 15)		CHANNEL (Page 15)		UNIT TOTALIZER (Page 15)		SET TOTALIZER (Page 15)		PRESET TOTALIZER (Page 16)		TOTALIZER MODE (Page 16)				
COMMUNICATION (Page 17)	TAG NAME (Page 17)		BUS ADDRESS (Page 17)		WRITE PROTECT (Page 17)		SELECTION GSD (Page 17)		SET UNIT TO BUS (Page 18)		PROFILE VERSION (Page 18)		ACT. BAUDRATE (Page 18)	DEVICE ID (Page 18)	CHECK CONFIG. (Page 18)	BLOCK SELECTION (Page 18)	
PROCESS PARAM. (Page 19)	OUT VALUE 1 (Page 18)		DISPLAY VALUE (Page 18)														
SYSTEM PARAM. (Page 22)	ASSIGN L/F CUT OFF (Page 19)		ON-VALUE (Page 19)		OFF-VALUE (Page 19)		EPD (Page 20)		EPD ADJUSTMENT (Page 21)		RESPONSE TIME (Page 21)						
SENSOR DATA (Page 23)	INST. DIR. SENSOR (Page 22)		MEASURING MODE (Page 22)		POS. ZERO RETURN (Page 22)		SYSTEM DAMPING (Page 22)		INTEGRAT. TIME (Page 22)								
SUPERVISION (Page 25)	K-FACTOR POSITIVE (Page 23)		K-FACTOR NEG. (Page 23)		ZERO POINT (Page 23)		NOM. DIAMETER (Page 23)		MEASUR. PERIOD (Page 23)		OVERVOLT. TIME (Page 24)		EPD ELECTRODE (Page 24)				
SIMULAT. SYSTEM (Page 27)	ACT. SYS. COND. (Page 25)		PREV. SYS. COND. (Page 25)		ASSIGN SYS ERR. (Page 25)		ERROR CATEG. (Page 25)		ASSIGN PROC. ERR. (Page 25)		ERROR CATEG. (Page 25)		ALARM DELAY (Page 25)		SYSTEM RESET (Page 26)		TROUBLESHOOT. (Page 26)
SENSOR VERSION (Page 28)	SIM. FAIL. MODE (Page 27)		SIM. MEASURAND (Page 27)		VALUE SIM. MEAS. (Page 27)												
AMPLIFIER VERSION (Page 28)	SERIAL NUMBER (Page 28)		SENSOR TYPE (Page 28)		SW REV. S-DAT (Page 28)												
	HW REV. AMP. (Page 28)		SW REV. AMP. (Page 28)		SW REV. I/O MOD. (Page 28)												

2 Group MEASURING VALUES

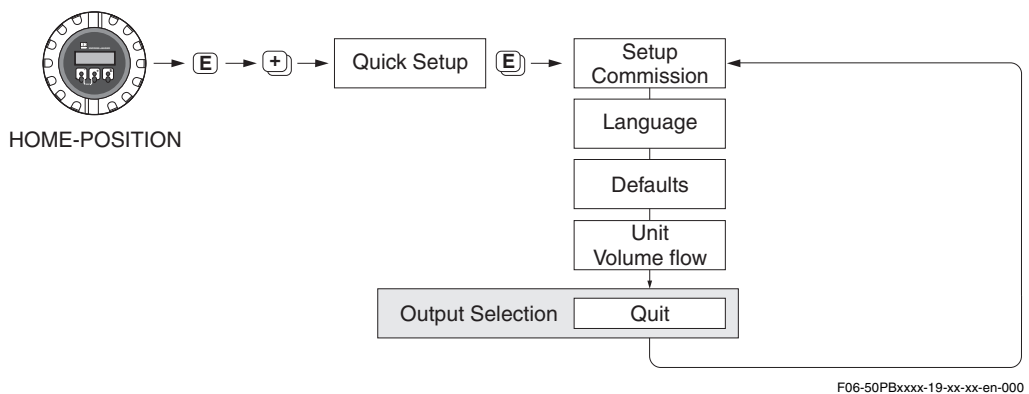
Function description MEASURING VALUES	
 Note: • The unit of measure of the measured variable shown here can be set in the "SYSTEM UNITS" group. • If the fluid in the pipe flows backwards, a negative sign prefixes the flow reading on the display.	
VOLUME FLOW	When you select this function, the current measured volume flow appears on the display. Display: 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm³/min; 1.4359 m³/h; -731.63 gal/d; etc.)

3 Group SYSTEM UNITS

Function description SYSTEM UNITS	
You can select the units for measured variables in this function group.  Note: - The units you select are not transmitted to the process-control system until the SET UNIT TO BUS function (see Page 18) is executed. - The factory settings of the local display as described here might not be the same as the factory settings of the PROFIBUS-PA output as sent to the process-control system (see the Operating Instructions <i>promag 50</i>, BA 055D/06/en/).	
UNIT VOLUME FLOW	Use this function to select the unit for displaying the volume flow. The unit you select here is also valid for: Low flow cut off Options: Metric: Cubic centimeter → cm³/s; cm³/min; cm³/h; cm³/day Cubic decimeter → dm³/s; dm³/min; dm³/h; dm³/day Cubic meter → m³/s; m³/min; m³/h; m³/day Milliliter → ml/s; ml/min; ml/h; ml/day Liter → l/s; l/min; l/h; l/day Hectoliter → hl/s; hl/min; hl/h; hl/day Megaliter → Ml/s; Ml/min; Ml/h; Ml/day US: Cubic centimeter → cc/s; cc/min; cc/h; cc/day Acre foot → af/s; af/min; af/h; af/day Cubic foot (ctf) → ft³/s; ft³/min; ft³/h; ft³/day Fluid ounce (flo) → oz f/s; oz f/min; oz f/h; oz f/day Gallon → gal/s; gal/min; gal/h; gal/day Million gallon → Mgal/s; Mgal/min; Mgal/h; Mgal/day Barrel (normal fluids: 31,5 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (beer: 31,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (petrochemicals: 42,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (filling tanks: 55,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Imperial Gallon → gal/s; gal/min; gal/h; gal/day Mega gallon → Mgal/s; Mgal/min; Mgal/h; Mgal/day Barrel (beer: 36,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (petrochemicals: 42,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Factory setting: depends on nominal diameter and country (dm³/min...m³/h or US-gal/min...US-Mgal/day) See factory settings on Page 29 and Page 31, as applicable.
UNIT VOLUME	 Note: This function is merely displayed on the local display; it is not processed by the measuring system.
UNIT LENGTH	Select the unit of length for displaying the nominal diameter. The unit you select here is valid for: nominal diameter of the sensor (NOMINAL DIAMETER function on Page 23) Options: MILLIMETER INCH Factory setting: depends on country (MILLIMETER or INCH) See factory settings on Page 29 and Page 31, as applicable.

4 Group QUICK SETUP

Function description QUICK SETUP	
QUICK SETUP COMMISSION	Use this function to start the Setup menu for commissioning. Options: YES NO Factory setting: NO



Note!
In the COMMISSIONING Quick Setup, restrict your entries to functions shown in the illustration above. As you work through the Quick Setup the system will display another function and selection as well (measuring mode): ignore these options. Entries in this function will not be processed by the measuring system.

5 Group OPERATION

Function description OPERATION	
LANGUAGE	Use this function to select the language for all texts, parameters and messages shown on the local display. Options: ENGLISH DEUTSCH FRANCAIS ESPANOL ITALIANO JAPANESE (syllabic) Factory setting: depends on the country; see Factory settings on Page 29 or Page 31, as applicable.  Note: If you press the  keys simultaneously during startup, the language defaults to "ENGLISH".
ACCESS CODE	All data of the measuring system are protected against inadvertent change. Programming is disabled and the settings cannot be changed until a code is entered in this function. If you press the  key in any function the measuring system automatically goes to this function and the prompt to enter the code appears on the display (programming disabled). You can enable programing by entering your private code (default = 50, see the DEFINE PRIVATE CODE function). User input: max. 4-digit number: 0...9999  Note: • The programming levels are disabled if you do not press a key within 60 seconds following automatic return to the HOME position. • You can also disable programming in this function by entering any number (other than the customer's code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code. • Certain functions are not accessible unless a special service code is entered. This code is known only to the Endress+Hauser service organisation. Please contact your E+H service center if you require clarification.
DEFINE PRIVATE CODE	Use this function to enter a personal code number for enabling programming. User input: 0...9999 (max. 4-digit number) Factory setting: 50  Note: • If the code number is "0", programming is always enabled. • Programming has to be enabled before this code can be changed. When programming is disabled the function is not available; this precaution prevents others from changing your personal code without your knowledge and consent.
STATUS ACCESS	Use this function to check the access status for the function matrix. Display: ACCESS CUSTOMER (parameterisation enabled) ACCESS SERVICE (parameterisation enabled) LOCKED (parameterisation disabled)

6 Group USER INTERFACE

Function description USER INTERFACE	
ASSIGN LINE 1	Use this function to define the display value assigned to the main line (the top line of the local display) for display during normal measuring operation. Options: OFF VOLUME FLOW VOLUME FLOW IN % AI 1 - OUT VALUE AO - DISPLAY VALUE TOT 1 - OUT VALUE Factory setting: VOLUME FLOW
ASSIGN LINE 2	Use this function to define the display value assigned to the additional line (the bottom line of the local display) for display during normal measuring operation. Options: OFF VOLUME FLOW VOLUME FLOW IN % MEASURING POINT DESIGNATION OPERATING/SYSTEM CONDITION FLOW DIRECTION VOLUME FLOW BARGRAPH IN % AI 1 - OUT VALUE AO - DISPLAY VALUE TOT 1 - OUT VALUE Factory setting: TOT 1 - OUT VALUE (TOTALIZER)
100% VALUE	 Note: This function is not available unless VOLUME FLOW BARGRAPH IN % or MASS FLOW BARGRAPH IN % was selected in the ASSIGN LINE 1 function or in the ASSIGN LINE 2 function. Use this function to define the flow value to be shown on the display as the 100% value. User input: 5-digit floating-point number Factory setting: 10 l/s

Function description USER INTERFACE	
FORMAT	Use this function to define the maximum number of places after the decimal point displayed for the reading in the main line. Options: XXXXX. - XXXX.X - XXX.XX - XX.XXX -X.XXXX Factory setting: X.XXXX  Note: - Note that this setting only affects the reading as it appears on the display, it has no influence on the accuracy of the system's calculations. - The places after the decimal point as computed by the measuring device cannot always be displayed, depending on this setting and the engineering unit. In these instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → l/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.
DISPLAY DAMPING	Use this function to enter a time constant defining how the display reacts to severely fluctuating flow variables, either very quickly (enter a low time constant) or with damping (enter a high time constant). User input: 0...100 seconds Factory setting: 1 s  Note: Setting the time constant to zero seconds switches off damping.
CONTRAST LCD	Use this function to optimise display contrast to suit local operating conditions. User input: 10...100% Factory setting: 50%
TEST DISPLAY	Use this function to test the operability of the local display and its pixels. Options: OFF ON Factory setting: OFF Test sequence: - Start the test by selecting ON. - All pixels of the main line, additional line and information line are darkened for min. 0.75 seconds. - Main line, additional line and information line show an "8" in each field for min. 0.75 seconds. - Main line, additional line and information line show a "0" in each field for min. 0.75 seconds. - Main line, additional line and information line show nothing (blank display) for min. 0.75 seconds. When the test completes the local display returns to its initial state and the setting changes to OFF.

7 Group TOTALIZERS

Function description COMMUNICATION	
SELECT TOTALIZER	Use this function to select a totalizer.  Note: The Promag 50 has only one totalizer. Options: TOTALIZER 1 Factory setting: TOTALIZER 1
TOTALIZER OUT VALUE	Use this function to view the TOTAL value (output measured value) and the corresponding unit of the totalizer.
CHANNEL	Use this function to assign a measured variable to the totalizer. Options: OFF VOLUME FLOW Factory setting: VOLUME FLOW
UNIT TOTALIZER	Use this function to define the unit for the totalizer measured variable. Options: Metric → cm³; dm³; m³; ml; l; hl; Ml US → cc; af; ft³ (cft); oz f (flo); gal; Mgal; bbl (normal fluids); bbl (beer); bbl (petrochemicals); bbl (filling tanks) Imperial → gal; Mgal; bbl (beer); bbl (petrochemicals) Factory setting: m³
SET TOTALIZER	Use this function to assign a status to the totalizer. Options: TOTALIZE Total the measured variable selected in the CHANNEL function. RESET Reset the totalizer to zero. PRESET Set the totalizer to the value defined in the PRESET TOTALIZER function.  Note: Note that selecting RESET or PRESET resets the totalizer to 0 or, respectively, sets it to the preset value, but does not stop the totalizer. This means that it immediately recommences totaling from the new setting. If you want to stop the totalizer you must select HOLD in the TOTALIZER MODE function. Factory setting: TOTALIZE

Function description COMMUNICATION	
PRESET TOTALIZER	Use this function to define a (start-) value for the totalizer.  Note: The totalizer does not accept this value unless the PRESET option was selected beforehand in the SET TOTALIZER function. User input: -99999...99999 Factory setting: 0
TOTALIZER MODE	Use this function to define how the totalizer totals the flow components. Options: BALANCE (positive and negative flow components) The positive and negative flow components are balanced. In other words, net flow in the flow direction is registered. FORWARD / POSITIVE Positive flow components only REVERSE / NEGATIVE Negative flow components only HOLD VALUE (HOLD) The totalizer stops. No further flow components are totaled. Factory setting: BALANCE

8 Group COMMUNICATION

Function description COMMUNICATION	
TAG NAME	Use this function to assign a tag name to the measuring device. You can edit and read this tag name at the local display or by means of the PROFIBUS protocol (class 2 master). User input: max. 16-character text, permissible: A-Z, 0-9, +, -, punctuation symbols Factory setting: "-----" (without text)
BUS ADDRESS	Use this function to define the address for the exchange of data with the aid of the PROFIBUS-PA protocol. User input: 0...126 Factory setting: 126
WRITE PROTECT	This function shows the position of the jumper used to set general hardware write protection. Display: OFF → write protection disabled ON → write protection enabled; functions cannot be changed at the local display or by means of the PROFIBUS protocol (class 2 master). Factory setting: OFF  Note: A jumper on the I/O board provides the means of enabling or disabling write protection (see the Operating Instructions <i>promag 50</i>, BA 055D/06/en/).
SELECTION GSD	 Note: In the configuration phase, each PROFIBUS device must check an ID number allocated by the PNO. Along with this device-specific ID number there are also PROFILE ID numbers that have to be accepted in the configuration phase as well, for the purposes of interchangeability between devices of different make. In this case the device might, under certain circumstances, reduce the functionality for cyclic data to a scope defined in the profile. Use this function to select the measuring device's configuration response. Options: MANUFACT.SPEC PROFILE-GSD Factory setting: MANUFACT.SPEC

Function description COMMUNICATION	
SET UNIT TO BUS	Use this function to enable transmission of the preset system units to the process-control system. Press the  button to send the preset system units to the process-control system. Options: SET UNITS (pressing the  button starts transmission)  Note: When transmission takes place the OUT value in the Analog Input block is automatically scaled to the selected system unit and the OUT unit (output unit) is displayed in the OUT_UNIT parameter. The default system units are listed in the Operating Instructions <i>Promag 50</i>, BA 055D/06/en/.  Caution: Activating this function can cause the OUT value to increase dramatically; this, in turn, can affect other control routines.
PROFILE VERSION	Use this function to view the profile version. Display: 3.0
ACTUAL BAUDRATE	Use this function to view the data transfer rate at which the device communicates, as set in the process-control system.
DEVICE ID	Use this function to view the manufacturer-specific device ID. Display: 0x1525 (= 1525 Hex)
CHECK CONFIGURATION	Use this function to check whether the configuration of a class 1 master for cyclic data interchange has been accepted in the Promag 50. Display: ACCEPTED (configuration accepted) NOT ACCEPTED (configuration not accepted)
BLOCK SELECTION	This function offers a choice of an Analog Input function block or the Analog Output (display value). If you select an Analog Input function block, the current measured value is displayed in the OUT VALUE 1 function. If you select Analog Output (display value), the current measured value is displayed in the DISPLAY VALUE function. Options: ANALOG INPUT 1 (volume flow) → displayed in OUT VALUE 1 ANALOG OUTPUT 1 (display value) → displayed in DISPLAY VALUE Factory setting: ANALOG INPUT 1 (volume flow)
OUT VALUE 1	 Note: This function is not available unless ANALOG OUTPUT 1 was selected in the BLOCK SELECTION function. Use this function to view the OUT value (output measured value) and the corresponding unit.
DISPLAY VALUE	 Note: This function is not available unless ANALOG OUTPUT 1 was selected in the BLOCK SELECTION function. Use this function to view the display value (output measured value) and the corresponding unit.

9 Group PROCESS PARAMETER

Function description PROCESS PARAMETER	
ASSIGN LOW FLOW CUT OFF	Use this function to assign the switching point for low flow cut off rate suppression in a technical engineering unit. Options: OFF VOLUME FLOW Factory setting: VOLUME FLOW
ON-VALUE LOW FLOW CUT OFF	Use this function to assign a value to the switch-on point for low flow cut off. Low flow cut off is active if the setting is a value not equal to 0. The sign of the flow value is highlighted on the display to indicate that low flow cut off is active. User input: 5-digit floating-point number Factory setting: depends on nominal diameter and country, [value] / [dm³...m³ or US-gal...US-Mgal] Corresponds to the factory setting for the full scale value (see Page 29 or Page 31).  Note: The appropriate unit is taken from the UNIT VOLUME FLOW function (see Page 10).
OFF-VALUE LOW FLOW CUT OFF	Use this function to assign a value to the switch-off point for low flow cut off. Enter the OFF-VALUE as a positive hysteresis from the ON-VALUE. User input: Integer 0...100% Factory setting: 50%

Function description PROCESS PARAMETER	
EMPTY PIPE DETECTION	Use this function to activate empty pipe detection (EPD). Options: OFF ON Factory setting: OFF  Note: • This function is not available unless the sensor is fitted with an EPD electrode. • The default setting for the EPD function when the device is delivered is OFF; the function has to be activated if required. • The EPD electrode is calibrated at the factory with water (500µS/cm). If the conductivity of the fluid differs from this reference, empty pipe/full pipe calibration has to be performed again on site (see the EPD ADJUSTMENT function on Page 21). • An empty or partially filled pipe is a process error. A factory default setting defines that a notice message is issued and that this process error has no effect on the outputs. • The EPD process error can be output by means of the PROFIBUS-PA output. • The calibration coefficients must be valid before you can activate EPD. If these coefficients are not available, the EPD ADJUSTMENT function (see Page 21) is displayed. Notes on Empty Pipe Detection (EPD) Flow cannot be measured correctly unless the measuring tube is full. This status can be monitored at all times with EPD. Response to partially filled pipe If EPD is on and responds to a partially filled or empty measuring tube, the message "EMPTY PIPE" appears on the display. If the pipe is partially filled or empty and EPD is not on, response can vary in identically configured systems: – Flow reading fluctuates – Zero flow – Excessively high flow readings  Note: Do not switch on the EPD function until empty pipe/full pipe calibration has been completed. If calibration is incorrect the following messages might appear on the display: • EPD ADJUSTMENT FULL = EMPTY: The calibration values for empty pipe and full pipe are identical. • EPD ADJUSTMENT NOT OK: EPD calibration is not possible because the fluid's conductivity is out of range. In these instances empty pipe/full pipe calibration must be performed again.

Function description PROCESS PARAMETER	
EPD ADJUSTMENT	Use this function to activate EPD calibration for an empty or full measuring tube. Options: OFF FULL PIPE ADJUST EMPTY PIPE ADJUST Factory setting: OFF Procedure for empty-pipe/full-pipe calibration 1. Empty the piping. Make sure that the wall of the measuring tube is wetted only with fluid for the calibration procedure. 2. Start empty pipe calibration: - Select "EMPTY PIPE ADJUST" and press [E] to confirm. 3. Fill the pipe with fluid. 4. Start full pipe calibration with the fluid at a standstill: - Select "FULL PIPE ADJUST" and press [E] to confirm. 5. Once calibration is completed, switch EPD on: Select "ON" (flashing) and press [E] to confirm.
EPD RESPONSE TIME	Use this function to enter the time span for which the criteria for an empty pipe have to be satisfied without interruption before a notice message or fault message is generated. User input: fixed-point number: 1.0...60.0 s Factory setting: 1.0 s

10 Group SYSTEM PARAMETER

Function description SYSTEM PARAMETER	
INSTALLATION DIRECTION SENSOR	Use this function to reverse the sign of the flow quantity, if necessary. Options: NORMAL (forward, flow in direction indicated by arrow) INVERSE (reverse, flow opposite to direction indicated by arrow) Factory setting: NORMAL  Note: Ascertain the actual direction of fluid flow with reference to the direction indicated by the arrow on the sensor (nameplate).
MEASURING MODE	 Note: This function is merely displayed on the local display; it is not processed by the measuring system.
POSITIVE ZERO RETURN	Use this function to interrupt evaluation of measured variables. This is necessary when a piping system is being cleaned, for example. The setting acts on all function and outputs of the measuring device. Options: OFF ON → signal output is set to "ZERO FLOW". Factory setting: OFF
SYSTEM DAMPING	 Note: Flow damping acts on all function and outputs of the measuring device. Use this function to set the filter depth of the digital filter. The sensitivity of the flow measurement signal can be reduced with respect to transient flows and interference peaks; e.g. with fluid containing solids or gas bubbles, etc. The system reaction time increasing with the filter number. User input: 0 ...15 Factory setting: 7
INTEGRATION TIME	Use this function to set the time during which the measuring signal is integrated. Under normal circumstances it is not necessary to change the factory default. User input: 3.3 ...65 ms Factory setting: 20 ms for 50 Hz → line frequency (e.g. Europe) 16.7 ms for 60 Hz → line frequency (e.g. USA)  Note: The integration time defines the time for internal addition of the induced voltage in the fluid (tapped by the measuring electrode), in other words the time in which the measuring device registers true flow (after which the magnetic field is reversed for the next integration cycle).

11 Group SENSOR DATA

Function description SENSOR DATA	
All sensor data (calibration factors, zero point and nominal diameter) are set ex-works and stored on the sensor's S-DAT™ memory chip.  Caution: Under normal circumstances you should not change these parameter settings, because changes affect numerous functions of the entire measuring system in general, and the accuracy of the measuring system in particular. Consequently, you cannot access the functions described below even if you enter your private code number. Contact the E+H service organisation if you have any questions about these functions.  Note: The individual values of the functions are listed on the sensor's rating plate.	
K-FACTOR POSITIVE	This function shows the current calibration factor (positive direction of flow) for the sensor. The calibration factor is calculated and set at the factory. Display: 5-digit fixed-point number: 0.5000 ...2.0000 Factory setting: depends on nominal diameter and calibration
K-FACTOR NEGATIVE	This function shows the current calibration factor (negative direction of flow) for the sensor. The calibration factor is calculated and set at the factory. Display: 5-digit fixed-point number: 0.5000 ...2.0000 Factory setting: depends on nominal diameter and calibration
ZERO POINT	This function shows the current zero-point correction value for the sensor. The zero-point correction factor is calculated and set at the factory. Display: max. 4-digit number: -1000 ...+1000 Factory setting: depends on nominal diameter and calibration
NOMINAL DIAMETER	This function shows the nominal diameter for the sensor. The nominal diameter depends on the size of the sensor and is set at the factory. Display: 2 ...2000 mm or 1/12 ...78" Factory setting: depends on the size of the sensor
MEASURING PERIOD	This is the function used to show the time for a full measuring period. If the value is 0 ms the system automatically computes the shortest time. The duration of a measuring period is the sum of the rise time for the magnetic field, the short recovery time, the (parameterisable) integration time and the EPD time. Display: 0.0...1000 ms Factory setting: depends on nominal diameter  Note: The system checks the user input and sets the actual measuring period used internally to a plausible value.

Function description SENSOR DATA	
 Caution: Under normal circumstances you should not change these parameter settings, because changes affect numerous functions of the entire measuring system in general, and the accuracy of the measuring system in particular. Consequently, you cannot access the functions described below even if you enter your private code number. Contact the E+H service organisation if you have any questions about these functions.	
OVERVOLTAGE TIME	This is the function used to define the time in which overvoltage is applied to the coil circuit in order to build up the magnetic field as quickly as possible. The overvoltage time is adjusted automatically while measuring is in progress. The overvoltage time depends on the type of sensor and the nominal diameter and is set at the factory. Display: 4-digit floating-point number: 0.0...100.0 ms Factory setting: depends on nominal diameter
EPD ELECTRODE	This function shows whether the sensor is equipped with an EPD electrode. Display: YES NO Factory setting: YES → for electrode fitted as standard

12 Group SUPERVISION

Function description SUPERVISION	
ACTUAL SYSTEM CONDITION	Use this function to check the present system status. Display: "SYSTEM OK" or the error/information message with the highest priority.
PREVIOUS SYSTEM CONDITION	Use this function to view the fifteen most recent error and notice messages since measuring last started. Display: the 15 most recent error or information messages.
ASSIGN SYSTEM ERROR	 Note: This function is not supported at this time. Use the  key combination or select CANCEL in the system error list to exit the function.
ERROR CATEGORY	 Note: This function is not supported at this time. This function is available only if CANCEL was not selected in the ASSIGN SYSTEM ERROR function. Press the  key twice in success to exit the function and return to the ASSIGN SYSTEM ERROR function.
ASSIGN PROCESS ERROR	 Note: This function is not supported at this time. Use the  key combination or select CANCEL in the process error list to exit the function.
ERROR CATEGORY	 Note: This function is not supported at this time. This function is available only if CANCEL was not selected in the ASSIGN PROCESS ERROR function. Press the  key twice in success to exit the function and return to the ASSIGN PROCESS ERROR function.
ALARM DELAY	Use this function to define a time for the suppression of error and notice messages. Depending on the setting and the type of error, this suppression acts on: • Display • PROFIBUS-PA User input: 0...100 s (in steps of one second) Factory setting: 0 s  Caution: If this function is activated error and notice messages are delayed by the time corresponding to the setting before being forwarded to the process-control system. It is therefore imperative to check in advance in order to make sure whether a delay of this nature could affect the safety requirements of the process. If error and information messages cannot be suppressed, a value of 0 seconds must be entered here.

Function description SUPERVISION	
SYSTEM RESET	Use this function to perform a reset of the measuring system. Options: NO RESTART SYSTEM (restart without interrupting line supply) Factory setting: NO
TROUBLESHOOTING (RST DATA FAILURE)	Use this function to rectify errors in the EEPROM (Error message AMP SW-EEPROM, # 012). The EEPROM is divided into a number of blocks. Only blocks which an error has occurred are shown. Select the block in question and press the  key to clear the error.  Note: Note!When you clear an error in a block, the parameters of the block you select are reset to their factory settings. Options: CANCEL MEASURING VALUES SYSTEM UNITS QUICK SETUP USER INTERFACE COMMUNICATION PROCESS PARAMETER SYSTEM PARAMETER SENSOR DATA AMP PARAMETER SUPERVISION VERSION-INFO

13 Group SIMULATION SYSTEM

Function description SIMULATION SYSTEM	
SIMULATION FAILSAFE MODE	Use this function to set all inputs, outputs and totalizers to their defined flow-response modes, in order to check whether they respond correctly. During this time, the words "SIMULATION ERROR RESPONSE" appear on the display. Options: ON OFF Factory setting: OFF
SIMULATION MEASURAND	Use this function to set all inputs, outputs and totalizers to their defined flow-response modes, in order to check whether they respond correctly. During this time, the words "SIMULATION MEASURAND" appear on the display. Options: OFF VOLUME FLOW Factory setting: OFF  Caution: • The measuring device cannot be used for measuring while this simulation is in progress. • The setting is not saved if the power supply fails.
VALUE SIMULATION MEASURAND	 Note: The function is not visible unless the SIMULATION MEASURAND function is active. Use this function to define a selectable value (e.g. 12 m³/s). This is used to test the associated functions in the flowmeter itself and downstream signal loops. User input: 5-digit floating-point number Factory setting: 0 [Unit]  Note: The appropriate unit is taken from the UNIT VOLUME FLOW function (see Page 10).  Caution: The setting is not saved if the power supply fails.

14 Group SENSOR VERSION

Function description SENSOR VERSION	
SERIAL NUMBER	Use this function to view the serial number of the sensor.
SENSOR TYPE	Use this function to view the sensor type.
SOFTWARE REVISION NUMBER S-DAT	Use this function to view the software revision number of the software used to create the content of the S-DAT.

15 Group AMPLIFIER VERSION

Function description AMPLIFIER VERSION	
HARDWARE REVISION NUMBER AMPLIFIER	Use this function to view the hardware revision number of the amplifier.
SOFTWARE REVISION NUMBER AMPLIFIER	Use this function to view the software revision number of the amplifier.
SOFTWARE REVISION NUMBER I/O MODULE	Use this function to view the software revision number of the I/O module.

16 Factory settings

16.1 SI units (not for USA and Canada)

16.1.1 Low flow cut off, full scale value, totalizer

Nominal diameter		Low flow cut off (approx. v = 0.04 m/s)		Full scale value (approx. v = 2.5 m/s)		Totalizer
[mm]	[inch]	Volume		Volume		Volume
2	1/12"	0.01	dm ³ /min	0.5	dm ³ /min	m ³
4	5/32"	0.05	dm ³ /min	2	dm ³ /min	m ³
8	5/16"	0.1	dm ³ /min	8	dm ³ /min	m ³
15	1/2"	0.5	dm ³ /min	25	dm ³ /min	m ³
25	1"	1	dm ³ /min	75	dm ³ /min	m ³
32	1 1/4"	2	dm ³ /min	125	dm ³ /min	m ³
40	1 1/2"	3	dm ³ /min	200	dm ³ /min	m ³
50	2"	5	dm ³ /min	300	dm ³ /min	m ³
65	2 1/2"	8	dm ³ /min	500	dm ³ /min	m ³
80	3"	12	dm ³ /min	750	dm ³ /min	m ³
100	4"	20	dm ³ /min	1200	dm ³ /min	m ³
125	5"	30	dm ³ /min	1850	dm ³ /min	m ³
150	6"	2.5	m ³ /h	150	m ³ /h	m ³
200	8"	5.0	m ³ /h	300	m ³ /h	m ³
250	10"	7.5	m ³ /h	500	m ³ /h	m ³
300	12"	10	m ³ /h	750	m ³ /h	m ³
350	14"	15	m ³ /h	1000	m ³ /h	m ³
400	16"	20	m ³ /h	1200	m ³ /h	m ³
450	18"	25	m ³ /h	1500	m ³ /h	m ³
500	20"	30	m ³ /h	2000	m ³ /h	m ³
600	24"	40	m ³ /h	2500	m ³ /h	m ³
700	28"	50	m ³ /h	3500	m ³ /h	m ³
–	30"	60	m ³ /h	4000	m ³ /h	m ³
800	32"	75	m ³ /h	4500	m ³ /h	m ³
900	36"	100	m ³ /h	6000	m ³ /h	m ³
1000	40"	125	m ³ /h	7000	m ³ /h	m ³
–	42"	125	m ³ /h	8000	m ³ /h	m ³
1200	48"	150	m ³ /h	10000	m ³ /h	m ³
–	54"	200	m ³ /h	13000	m ³ /h	m ³
1400	–	225	m ³ /h	14000	m ³ /h	m ³
–	60"	250	m ³ /h	16000	m ³ /h	m ³
1600	–	300	m ³ /h	18000	m ³ /h	m ³
–	66"	325	m ³ /h	20500	m ³ /h	m ³
1800	72"	350	m ³ /h	23000	m ³ /h	m ³
–	78"	450	m ³ /h	28500	m ³ /h	m ³
2000	–	450	m ³ /h	28500	m ³ /h	m ³

16.1.2 Language

Country	Language
England, Singapore, South Africa, International Instruments	English
Germany, Austria, Switzerland	Deutsch
France, Belgium	Francais
Spain	Espanol
Italy	Italiano
Holland	Nederlands
Denmark	Dansk
Norway	Norsk
Sweden	Svenska
Finland	Suomi
Thailand, Malaysia, Hong Kong	Bahasa/Indonesia
Japan	Japanese

16.1.3 Length

	Unit
Length	mm

16.2 US units (USA and Canada only)

16.2.1 Low flow cut off, full scale value, totalizer

Nominal diameter		Low flow cut off (approx. v = 0.04 m/s)		Full scale value (approx. v = 2.5 m/s)		Totalizer
[mm]	[inch]	Volume		Volume		Volume
2	1/12"	0.002	gal/min	0.1	gal/min	m ³
4	5/32"	0.008	gal/min	0.5	gal/min	m ³
8	5/16"	0.025	gal/min	2	gal/min	m ³
15	1/2"	0.10	gal/min	6	gal/min	m ³
25	1"	0.25	gal/min	18	gal/min	m ³
32	1 1/4"	0.50	gal/min	30	gal/min	m ³
40	1 1/2"	0.75	gal/min	50	gal/min	m ³
50	2"	1.25	gal/min	75	gal/min	m ³
65	2 1/2"	2.0	gal/min	130	gal/min	m ³
80	3"	2.5	gal/min	200	gal/min	m ³
100	4"	4.0	gal/min	300	gal/min	m ³
125	5"	7.0	gal/min	450	gal/min	m ³
150	6"	12	gal/min	600	gal/min	m ³
200	8"	15	gal/min	1200	gal/min	m ³
250	10"	30	gal/min	1500	gal/min	m ³
300	12"	45	gal/min	2400	gal/min	m ³
350	14"	60	gal/min	3600	gal/min	m ³
400	16"	60	gal/min	4800	gal/min	m ³
450	18"	90	gal/min	6000	gal/min	m ³
500	20"	120	gal/min	7500	gal/min	m ³
600	24"	180	gal/min	10500	gal/min	m ³
700	28"	210	gal/min	13500	gal/min	m ³
–	30"	270	gal/min	16500	gal/min	m ³
800	32"	300	gal/min	19500	gal/min	m ³
900	36"	360	gal/min	24000	gal/min	m ³
1000	40"	480	gal/min	30000	gal/min	m ³
–	42"	600	gal/min	33000	gal/min	m ³
1200	48"	600	gal/min	42000	gal/min	m ³
–	54"	1.3	Mgal/d	75	Mgal/d	m ³
1400	–	1.3	Mgal/d	85	Mgal/d	m ³
–	60"	1.3	Mgal/d	95	Mgal/d	m ³
1600	–	1.7	Mgal/d	110	Mgal/d	m ³
–	66"	2.2	Mgal/d	120	Mgal/d	m ³
1800	72"	2.6	Mgal/d	140	Mgal/d	m ³
–	78"	3.0	Mgal/d	175	Mgal/d	m ³
2000	–	3.0	Mgal/d	175	Mgal/d	m ³

16.2.2 Language, length

	Unit
Language	English
Length	mm

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1 Remote operation via PROFIBUS-PA

1.1 Block model

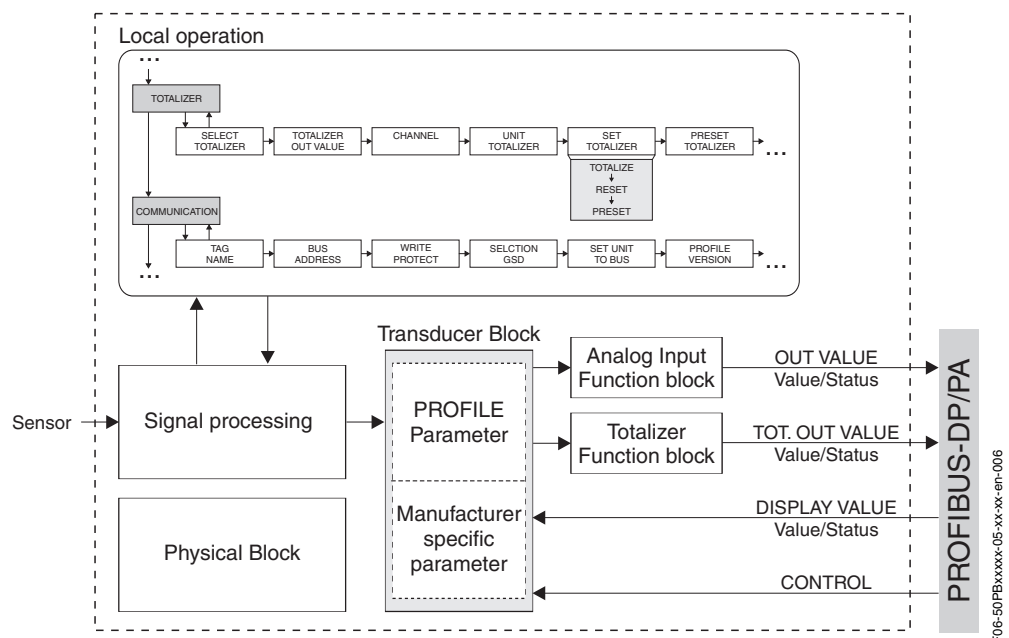
In the PROFIBUS-PA, all the device parameters are categorised according to their functional properties and task and are generally assigned to three different blocks. A block may be regarded as a container in which parameters and the associated functionalities are contained.

A PROFIBUS-PA device has the following block types:

- A Physical block
The Physical block contains all the device-specific characteristics of the device.
- One or more Transducer blocks (transmission blocks)
The Transducer block contains all the measuring technology and device-specific parameters of the device. The measurement principles (e.g. flow, temperature) are depicted in the Transducer blocks in accordance with the PROFIBUS-PA Profile 3.0 specification.
- One or more function blocks
Function blocks contain the automation functions of the device. We distinguish between different function blocks, e.g. Analog Input function block, Analog Output function block, Totalizer block, etc. Each of these function blocks is used to process different application functions.

A number of automation-related tasks can be implemented with these blocks.

In addition to these blocks, a field device may have any number of further blocks, e.g. several Analog Input function blocks if more than one process variable is available to from the field device.



The sensor signal is first prepared specifically for the flow in the measuring block (the Transducer block). The process variable (Volume Flow) is then passed to the Analog Input and Totalizer function blocks for technical processing (e.g. scaling, limit value processing). The process variable goes through the entire function-block algorithm and is available to the process-control system as an output variable.

2 Physical block

A Physical block contains all the data that uniquely identifies and characterises the field device. It is an electronic version of a nameplate on the field device. Parameters of the Physical block include device type, device name, manufacturer ID, serial number, etc.

A further task of the Physical blocks is the management of overall parameters and functions that have an influence on the execution of the remaining blocks in the field device. The Physical block is thus the central unit that also checks the device status and thereby influences or controls the operability of the other blocks and thus also of the device.

2.1 Write protection

Hardware write protection for the device parameters is activated and deactivated by means of a jumper on the PROFIBUS-PA I/O board (see the Operating Instructions *promag 50*, BA 055D/06/en/).

The HW_WRITE_PROTECTION parameter (see Page 39) shows the status of hardware write protection.

The following statuses are possible:

- 1 → Hardware write protection enabled, it is not possible to write to the device
- 0 → Hardware write protection disabled, device data can be overwritten

It is also possible to set software write protection to prevent all parameters from being acyclically overwritten. This lock is set by means of the WRITE_LOCKING parameter (see Page 39)

The following are the permissible entries:

- 2457 → Device data can be overwritten (factory default)
- 0 → Device data can not be overwritten

2.2 Parameters, Physical block

The following table shows all the available parameters of the Physical block.

Abbreviations used in the table:

- R = Read
- W = Write
- P = Parameter, with a distinction between:
 - M = “Mandatory” (obligatory) parameter
 - O = Optional parameter

Physical block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
DEVICE_DATA (V0...)					
DEVICE_ID (V0H0)	DEVICE_ID	Use this function to view the manufacturer-specific device ID. Display: PROMAG 50 PBUS	X		M
SERIAL_NUMBER (V0H1)	DEVICE_SER_NUM	Use this function to view the serial number of the measuring device.	X		M

Physical block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SOFTWARE_ VERSION (V0H2)	SOFTWARE_ VERSION	Use this function to view the software version number of the measuring device.	X		M
HARDWARE_ VERSION (V0H3)	HARDWARE_ VERSION	Use this function to view the hardware version number of the measuring device.	X		M
MANUFACTURER_ ID (V0H4)	DEVICE_MAN_ID	Use this function to view the manufacturer's ID number. Display: 17 (decimal)	X		M
DESCRIPTION (V1...)					
DESCRIPTOR (V1H0)	DESCRIPTOR	You can use this parameter to enter a description of the application for which the measuring device is used. Factory setting: No description	X	X	O
INSTALLATION_ DATE (V1H1)	DEVICE_INSTALL_ DATE	You can use this parameter to enter the installation date of the measuring device. Factory setting: No date	X	X	O
MESSAGE (V1H2)	DEVICE_ MESSAGE	You can use this parameter to enter a message about the application for which the measuring device is used. Factory setting: No message	X	X	O
DEVICE_ CERTIFICATE (V1H3)	DEVICE_ CERTIFICATION	Use this parameter to view information about certification of the measuring device. Factory setting: No information	X		O
SOFTWARE_RESET (V2...)					
SOFTWARE_ RESET (V2H0)	FACTORY_RESET	You can use this parameter to reset or restart the measuring device. User input: 0 → No action 1 → Reset all parameters to their factory defaults, with the exception of the station address, which remains as set. The measuring device shows the next cold start for 10 seconds in the appropriate bit of the DIAGNOSIS parameter group. 2506 → Perform a warm start. The measuring device shows the next warm start for 10 seconds in the appropriate bit of the DIAGNOSIS parameter group. 2712 → Reset the station address to the usual PROFIBUS default address, 126. Factory setting: 1	X	X	O

Physical block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SECURITY_LOCKING (V3...)					
WRITE_LOCKING (V3H0)	WRITE_LOCKING	Use this parameter to activate write protection for the acyclic parameters. User input: 0 → Write protection enabled, parameters cannot be overwritten. 2457 → Write protection disabled, parameters can be overwritten. Factory setting: 2457  Note! An "Access denied" error message is displayed if an attempt is made to change a parameter settings when write protection is enabled.	x	x	o
HW_WRITE_PROTECT (V3H1)	HW_WRITE_PROTECTION	This parameter shows the position of the jumper used to set general hardware write protection. Display: 0 → Write protection disabled, parameters can be overwritten. 1 → Write protection, parameters cannot be overwritten at the local display or by means of the PROFIBUS protocol (class 2 master). Factory setting: 0  Note! A jumper on the I/O board provides the means of activating or deactivating write protection (see the Operating Instructions <i>Promag 50</i>, BA 055D/06/en/).	x		o
LOCAL_OPERATION (V3H2)	LOCAL_OP_ENA	 Note! This parameter is not supported by the Promag 50. Parameter for enabling the local display.	x	x	o

Physical block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
DEVICE_DATA (V4...)					
IDENT_NUMBER (V4H0)	IDENT_NUMBER_SELECTOR	 Note! In the configuration phase, each PROFIBUS device must check an ID number allocated by the PNO (PROFIBUS user organisation). Along with this device-specific ID number there are also PROFILE ID numbers that have to be accepted in the configuration phase as well, for the purposes of interchangeability between devices of different make. In this case the device might, under certain circumstances, reduce the functionality for cyclic data to a scope defined in the profile. Use this parameter to select the measuring device's configuration response. Options: 0 → Entry for PROFILE ID number 1 → Entry for the device-specific ID number 2 → Entry for the device-specific ID number of the predecessor device (Profile 2.0) 3 → Entry for the PROFILE ID number (0x9760) for multi-variable devices  Note! Options 2 and 3 are not supported by the Promag 50. Factory setting: 1	X	X	M
DIAGNOSIS_MASK (V5...)					
MASK (V5H0)	DIAGNOSIS_MASK (Byte 1)	Bit mask indicating which DIAGNOSIS bits of the first diagnosis byte are supported. Display: 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
MASK_1 (V5H1)	DIAGNOSIS_MASK (Byte 2)	Bit mask indicating which DIAGNOSIS bits of the second diagnosis byte are supported. Display: 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
MASK_2 (V5H2)	DIAGNOSIS_MASK (Byte 4)	Bit mask indicating which DIAGNOSIS bits of the fourth diagnosis byte are supported. Display: 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
DIAG_MASK_EXTENS. (V5H3)	DIAGNOSIS_MASK EXTENSION	Bit mask indicating the manufacturer-specific diagnosis messages. (See also the section on system and process error messages in the Operating Instructions for the <i>promag 50</i> (BA 055D/06/en/))	X		O

Physical block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
DIAGNOSIS (V6...)					
DIAGNOSIS (V6H0)	DIAGNOSIS (Byte 1)	Diagnosis information of the measuring device (first byte) with bit encoding. Several messages are possible. Manufacturer-specific information, if available, is shown in the DIAGNOSIS_EXT parameter.	X		M
DIAGNOSIS_1 (V6H1)	DIAGNOSIS (Byte 2)	Diagnosis information of the measuring device (second byte) with bit encoding. Several messages are possible. Manufacturer-specific information, if available, is shown in the DIAGNOSIS_EXT parameter. Display: 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
DIAGNOSIS_2 (V6H2)	DIAGNOSIS (Byte 4)	Diagnosis information of the measuring device (fourth byte) with bit encoding. Several messages are possible. Manufacturer-specific information, if available, is shown in the DIAGNOSIS_EXT parameter. Display: 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
DIAGNOSIS_EXT (V6H3)	DIAGNOSIS_EXT EXTENSION	Manufacturer-specific information with bit encoding. Several messages are possible.	X		O
BLOCK_MODE (V8...)	General information on the MODE_BLK parameter group: There are three elements in this parameter group: - the current operating mode of the block (Actual_Mode) - the modes supported by the block (Permitted_Mode) - the normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the out-of-service mode (O/S). A function block generally offers a choice of operating modes, whereas the other block types support only the AUTO mode, for example.				
TARGET_MODE (V8H0)	TARGET_MODE	The selected operating mode. Only the automatic mode can be selected for the Physical block. Options: AUTO Factory setting: AUTO	X	X	M
ACTUAL (V8H1)	MODE_BLOCK (Actual)	Displays the current operating mode. Display: AUTO	X		M
NORMAL (V8H2)	MODE_BLOCK (Normal)	Displays the operating mode for normal operation. Display: AUTO	X		M
PERMITTED (V8H3)	MODE_BLOCK (Permitted)	Displays the permissible operating modes. Display: AUTO	X		M

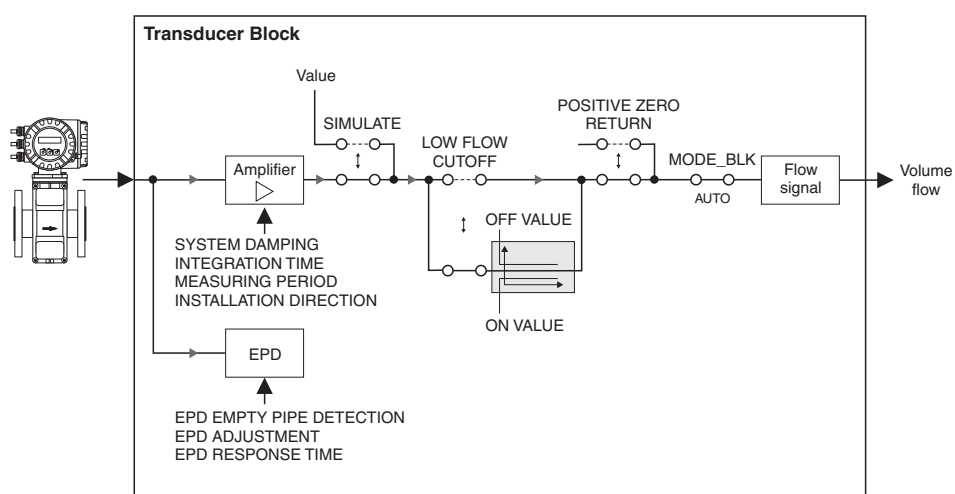
Physical block						
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P	
ALARM_CONFIG (V9...)	General information on the ALARM_CONFIG parameter group: The block supported is the Active Block Alarm, which flags a change in a parameter with static values (Static attribute) for 10 seconds and indicates that an warning limit or an alarm limit has been violated in a function block.					
CURRENT (V9H0)	ALARM_SUM (CURRENT)	Use this parameter to view information about the current alarms of the measuring device.	X			M
DISABLE (V9H1)	ALARM_SUM (DIS- ABLE)	Use this parameter to view information about the acknowledged alarms of the measuring device.	X			M
ST_REVISION (V9H5)	ST_REV	A block has static parameters (Static attribute) that are not changed by the process. Static parameters with values that change during optimisation or configuration increment the ST_REV parameter by 1. This supports parameter-revision management. The Static Revision Counter can show a higher value if several parameters change within a very short period of time, for example when parameters are uploaded to the measuring device from Commuwin II. This counter is never reset, nor does it return to a default setting even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X			M
BLOCK_PARAMETER (VA...)						
TAG (VAH0)	TAG_DESC	Entry of a user-specific text of max. 32 characters for unique identification and assignment of the block. Factory setting: "-----" without text	X	X		M
STRATEGY (VAH1)	STRATEGY	Parameter for grouping and thus faster evaluation of blocks. Grouping is carried out by entering the same numerical value in the parameter STRATEGY for each individual block. Factory setting: 0	X	X		M
ALERT_KEY (VAH2)	ALERT_KEY	Entry of the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. User input: 1...255 Factory setting: 0	X	X		M
PROFILE_VERSION (VAH3)	—	Displays the profile version implemented in the device. Display: 30 (3.0)	X			O

3 Transducer block (transmission block)

The Transducer block of the Promag 50 PROFIBUS-PA contains all the measurement- and device-specific parameters of the flowmeter. All the settings directly connected with the flow measurement/application are made here. It forms the interface between the sensor-specific measured value preprocessing and the function blocks required for automation.

A Transducer block allows you to influence the input and output values of a function block. The parameters of a Transducer block include information on the sensor configuration, physical units, calibration, damping, error messages, etc. as well as the device-specific parameters.

The figure shows the internal structure of the Transducer block of the Promag 50 PROFIBUS-PA:



F06-50PBxxx-05-xx-xx-en-000

3.1 Signal processing

The input variable received by the Transducer block is a sensor signal that is proportional to the current flow. This input signal is prepared by the amplifier, taking into account certain externals such as system attenuation and integration time.

The SIMULATION MEASURAND parameter (see Page 62) allows you to specify a simulation value for the Transducer block in order to test assigned parameters in the device and subsequent function blocks.

A low flow cut off allows you to hide measurement inaccuracies in the low-flow sector. You can define limit values by means of the parameters for setting the activation and deactivation thresholds for low flow cut off (see Page 47). If the measured flow value is below one of these limit values, the output value of 0 is output.

You also have the option of setting the measured value to "Zero Flow" by means of the parameter for measured-value suppression (see Page 53). This is necessary when a piping system is being cleaned, for example.

The Transducer block's process variable is shown in the VOLUME FLOW parameter (see Page 44).

The major functions and parameters of the Transducer block are listed below; you will find an overview of all the available parameters starting on Page 44.

3.2 Block output variables

The Transducer block has a fixed process variable (volume flow) that is output in the VOLUME FLOW parameter. The relationship between the process variable and the next Analog Input function block AI1 is predefined and cannot be changed.

3.3 Alarm detection and processing

The Transducer block does not generate any process alarms. The status of the process variable of the Transducer block is evaluated in the subsequent Analog Input function block. If the Analog Input function block receives no input value that can be evaluated from the Transducer block then a process alarm is generated. This process alarm is displayed in the OUT_STATUS, OUT_SUB_STATUS and OUT_LIMIT parameters of the Analog Input function block (see Page 74).

Detailed information on the current device status is shown in the device-specific ACTUAL_ERROR_CODE parameter (see Page 60).

The parameter displays the device error that produced an input value that could not be evaluated and thus triggered the process alarm in the Analog Input Function Block. More information on remedying errors can be found in the Operating Instructions *promag 50*, BA 055D/06/en/.

3.4 Access to manufacturer-specific parameters

To access the device-specific parameters the following requirements must be met:

1. Hardware write protection must be disabled (Page 37).
2. The correct code must be entered in the CODE_ENTRY parameter (see Page 56).

3.5 Parameters, Transducer block

The following table shows all the available parameters of the Transducer block. The parameters can be changed by means of class 2 master, such as Commuwin II or PDM (Process Device Management).

A gray ■ background marks the manufacturer-specific parameters. These parameters are not accessible until the Unlocking/Locking access code has been entered.

Abbreviations used in the table:

- R = Read
- W = Write
- P = Parameter, with a distinction between:
 - M = "Mandatory" (obligatory) parameter
 - O = Optional parameter

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
MEASURING VALUES (V0...)					
VOLUME FLOW (V0H0)	VOLUME_FLOW	Displays the current measured value of the process variable (volume flow) made available to the Analog Input 1 function block as an input value. Display: 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm ³ /min; 1.4359 m ³ /h; etc.)	X		M

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SYSTEM UNITS (V1...)					
UNIT VOL. FLOW (V1H0)	VOLUME_FLOW_UNITS	Use this parameter to select the unit for the volume flow. Options: Metric: Cubic centimeter → cm³/s; cm³/min; cm³/h; cm³/day Cubic decimeter → dm³/s; dm³/min; dm³/h; dm³/day Cubic meter → m³/s; m³/min; m³/h; m³/day Milliliter → ml/s; ml/min; ml/h; ml/day Liter → l/s; l/min; l/h; l/day Hectoliter → hl/s; hl/min; hl/h; hl/day Megaliter → Ml/s; Ml/min; Ml/h; Ml/day US: Cubic centimeter → cc/s; cc/min; cc/h; cc/day Acre foot → af/s; af/min; af/h; af/day Cubic foot (cft) → ft³/s; ft³/min; ft³/h; ft³/day Fluid ounce (flo) → oz f/s; oz f/min; oz f/h; oz f/day Gallon → gal/s; gal/min; gal/h; gal/day Million gallon → Mgal/s; Mgal/min; Mgal/h; Mgal/day Barrel (normal fluids: 31,5 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (beer: 31,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (petrochemicals: 42,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (filling tanks: 55,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Imperial Gallon → gal/s; gal/min; gal/h; gal/day Mega gallon → Mgal/s; Mgal/min; Mgal/h; Mgal/day Barrel (beer: 36,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Barrel (petrochemicals: 42,0 gal/bbl) → bbl/s; bbl/min; bbl/h; bbl/day Factory setting: m³/h	X	X	M
UNIT LENGTH (V1H4)	NORMAL_SIZE_UNIT	Use this parameter to select the unit for displaying the unit of length for nominal diameter. Options: MILLIMETER INCH Factory setting: MILLIMETER	X	X	M

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
USER INTERFACE (V2...)					
ACCESS CODE (V2H0)	ACCESS_CODE	All data of the measuring system are protected against inadvertent change. Programming is disabled and the settings cannot be changed until a code is entered in this parameter. You can enable programing by entering your private code (default = 50, see the DEFINE_PRIVATE_CODE parameter). User input: max. 4-digit number: 0...9999  Note! • If write protection is enabled, access to the manufacturer-specific parameters is blocked even if the right code is entered. • You can also disable programming in this parameter by entering any number (other than the customer's code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.		X	O
DEFINE PRIVATE CODE (V2H1)	DEFINE_PRIVATE_CODE	Use this parameter to enter a personal code number for enabling programming. User input: 0...9999 (max. 4-digit number) Factory setting: 50  Note! • If the code number is "0", programming is always enabled. • Programming has to be enabled before this code can be changed. When programming is disabled the parameter is not available; this precaution prevents others from changing your personal code without your knowledge and consent.	X	X	O
STATUS_ACCESS (V2H2)	STATUS_ACCESS	Use this parameter to check the access status for the manufacturer-specific parameters. Display: CUSTOMER (parameterisation enabled) SERVICE (parameterisation enabled) LOCKED (parameterisation disabled)	X		O

Transducer block (device matrix)							
Matrix text		Parameter		Description	R	W	P
(Commuwin II)	(SLOT/INDEX)						
LF-CUT OFF PARAMETER (V3...)							
ASSIGN LF-CUTOFF (V3H0)	ASSIGN_LOW_FLOW_CUTOFF	Use this parameter to assign the switching point for low flow cut off in a technical engineering unit. Options: OFF VOLUME FLOW Factory setting: VOLUME FLOW			x	x	o
ON VAL_LF CUTOFF (V3H2)	ON_VALUE_LOW_FLOW_CUTOFF	Use this parameter to assign a value to the switch-on point for low flow cut off. Low flow cut off is active if the setting is a value not equal to 0. User input: 5-digit floating-point number Factory setting: 0.0000			x	x	o
OFF VAL_LF CUTOFF (V3H2)	OFF_VALUE_LOW_FLOW_CUTOFF	Use this parameter to assign a value to the switch-off point for Low flow cut off. Enter the OFF-VALUE as a positive hysteresis from the ON-VALUE. User input: Integer 0...100% Factory setting: 50%			x	x	o

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
EPD PARAMETER (V4...)					
EMPTY PIPE DETECTION (V4H0)	EMPTY_PIPE_DETECTION	Use this parameter to activate empty pipe detection (EPD). Options: OFF ON Factory setting: OFF  Note! - This parameter is not available unless the sensor is fitted with an EPD electrode. - The default setting for the EPD function when the device is delivered is OFF; the function has to be activated if required. - The EPD electrode is calibrated at the factory with water (500µS/cm). If the conductivity of the fluid differs from this reference, empty pipe/full pipe calibration has to be performed again on site (see the EPD_ADJUSTMENT parameter, Page 49). - An empty or partly filled pipe is a process fault and is reported to the higher-order process-control system in cyclic status as UNCERTAIN (Hex 40). - The calibration coefficients must be valid before you can activate EPD. If these coefficients are not available, the EPD_ADJUSTMENT parameter is displayed. Notes on Empty Pipe Detection (EPD) Flow cannot be measured correctly unless the measuring tube is full. This status can be monitored at all times with EPD. Response to partially filled pipe If EPD is enabled and trips in response to a partially filled or empty measuring tube, the message "EMPTY PIPE" appears on the local display. If the measuring tube is partially filled or empty and EPD is not enabled, response can vary in identically configured systems: - Flow reading fluctuates - Zero flow - Excessively high flow readings  Note! Do not switch on EPD until empty pipe/full pipe calibration has been completed. If calibration is incorrect the following messages might appear on the display: - EPD ADJUSTMENT FULL = EMPTY: The calibration values for empty pipe and full pipe are identical. - EPD ADJUSTMENT NOT OK: EPD calibration is not possible because the fluid's conductivity is out of range. In these instances empty pipe/full pipe calibration must be performed again.	x	x	o

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
EPD_ ADJUSTMENT (V4H3)	EPD_ ADJUSTMENT	Use this parameter to activate EPD calibration for an empty or full measuring tube. Options: OFF FULL PIPE ADJUST EMPTY PIPE ADJUST Factory setting: OFF Procedure for empty-pipe/full-pipe calibration 1. Empty the piping. Make sure that the wall of the measuring tube is wetted only with fluid for the calibration procedure. 2. Start empty-pipe calibration: select "EMPTY PIPE ADJUST" and confirm your choice. 3. Fill the pipe with fluid. 4. Start full-pipe calibration with fluid at a standstill: select "FULL PIPE ADJUST" and confirm your choice. 5. Once calibration is completed, switch EPD on.	x	x	o
EPD_ RESPONSE TIME (V4H4)	EPD_RESPONSE_ TIME	Use this parameter to enter the time span for which the criteria for an empty measuring tube have to be satisfied without interruption before an information message or error message is generated. User input: fixed-point number: 1.0...60.0 s Factory setting: 1.0 s	x	x	o
EPD_ ELECTRODE (V4H6)	EPD_ELECTRODE	This function shows whether the sensor is equipped with an EPD electrode. Display: YES NO Factory setting: YES → for electrode fitted as standard	x	x	o

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
PROFIBUS-PA (V6...)					
WRITE_PROTECT (V6H0)	HW_WRITE_PROTECTION	Shows whether general hardware write protection is enabled or disabled. Display: OFF → Hardware write protection disabled ON → Hardware write protection enabled; parameters cannot be changed at the local display or by means of the PROFIBUS protocol (class 2 master). Factory setting: OFF  Note! A jumper on the I/O board provides the means of enabling or disabling hardware write protection (see the Operating Instructions <i>promag 50</i>, BA 055D/06/en/)	X		O
SELECTION_GSD (V6H1)	IDENT_NUMBER_SELECTOR	 Note! In the configuration phase, each PROFIBUS device must check an ID number allocated by the PNO (PROFIBUS user organisation). Along with this device-specific ID number there are also PROFILE ID numbers that have to be accepted in the configuration phase as well, for the purposes of interchangeability between devices of different make. In this case the device might, under certain circumstances, reduce the functionality for cyclic data to a scope defined in the profile. Use this parameter to select the measuring device's configuration response. Options: MANUFACT.SPEC PROFILE GSD Factory setting: MANUFACT.SPEC	X	X	M
SET_UNIT_TO_BUS (V6H2)	SET_UNIT_TO_BUS	Use this parameter to transmit the preset system unit to the process-control system. When transmission takes place the OUT value in the Analog Input block is automatically scaled to the selected system unit and the OUT unit (output unit) is displayed in the OUT_UNIT parameter. The default system units are listed in the Operating Instructions for the <i>promag 50</i> BA 055/06/en. Options CANCEL – YES (SET UNITS) Factory setting: CANCEL  Caution: Activating this function can cause the OUT value to increase dramatically; this, in turn, can affect other control routines.	X	X	O

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter		Description	R	W
	(SLOT/INDEX)				
BLOCK_SELECTION (V6H3)	BLOCK_SELECTION		You can use this parameter to select an Analog Input function block whose OUT (output) value will be displayed, complete with unit and status. Options: ANALOG INPUT 1 Factory setting: ANALOG INPUT 1	x	x
OUT_VALUE (V6H4)	OUT_VALUE		This parameter display the OUT (output) value of the Analog Input function block selected in the BLOCK SELECTION parameter; the value is displayed complete with unit.	x	o
OUT_STATUS (V6H5)	OUT_VALUE		Use this parameter to display the OUT (output) status in hexadecimal notation. The meanings of the individual status values are described in Operating Instructions <i>promag 50</i>, BA 055D/06/en/.  Note! This parameter cannot be viewed on the local display.	x	o
DISPLAY_VALUE (V6H6)	LOCAL_DISPLAY_INPUT		Use this parameter to transfer a value calculated by a process-control system directly to the Promag 50. This is a display-only value: it cannot be processed by the system.  Note! BAD (00 Hex) is displayed as the status if no status information is sent to the device.	x	o
DISP.VAL.STATUS (V6H7)	LOCAL_DISPLAY_INPUT		Use this parameter to display the Status display value in hexadecimal notation. The meanings of the individual status values are described in Operating Instructions <i>promag 50</i>, BA 055D/06/en/.  Note! BAD (00 Hex) is displayed as the status if no status information is sent to the device.	x	o

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
PROFIBUS_INFO (V7...)					
BUS ADDRESS (V7H0)	DEV_BUS_ADDR	Use this parameter to view the measuring device's bus address. User input: 0...126 Factory setting: 126  Note! This parameter is only for viewing the bus address. The device address can be edited with the DDE server (and Commuwin II) and using the local display.	x	x	o
PROFILE VERSION (V7H1)	—	Use this parameter to view the profile version.	x		o
ACTUAL BAUDRATE (V7H2)	ACTUAL_BAUDRATE	Use this parameter to view the data transfer rate at which the device communicates, as set in the process-control system.	x		o
DEVICE_ID (V7H3)	DEVICE_ID	Use this parameter to view the manufacturer-specific device ID. Display: 0x1525 (1525 Hex)	x		o
CHECK_CONFIG. (V7H4)	CHECK_CONFIG	Use this parameter to check whether the configuration of a class 1 master has been accepted for cyclic data interchange in the Promag 50. Display: ACCEPTED (configuration accepted) NOT ACCEPTED (configuration not accepted)	x		o
SYSTEM PARAMETERS (V8...)					
INSTL. DIR. SENSOR (V8H0)	INSTALL_DIRECTION_SENSOR	Use this parameter to reverse the sign of the flow quantity, if necessary. Options: FORWARD (flow in direction indicated by arrow) REVERSE (flow opposite to direction indicated by arrow) Factory setting: FORWARD  Note! Ascertain the actual direction of fluid flow with reference to the direction indicated by the arrow on the sensor (nameplate).	x	x	o

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SYSTEM DAMPING (V8H1)	SYSTEM_ DAMPING	 Note! System damping acts on all parameters and the PROFIBUS-PA output of the measuring device. Use this parameter to set the filter depth of the digital filter. The sensitivity of the flow measurement signal can be reduced with respect to transient flows and interference peaks; e.g. with fluid containing solids or gas bubbles, etc. The system reaction time increasing with the filter number. User input: 0 ...15 Factory setting: 7	x	x	o
INTEGRATION TIME (V8H2)	INTEGRATION_ TIME	Use this parameter to set the time during which the measuring signal is integrated. Under normal circumstances it is not necessary to change the factory default. User input: 3.3 ...65 ms Factory setting: 20 ms for 50 Hz → line frequency (e.g. Europe) 16.7 ms for 60 Hz → line frequency (e.g. USA)  Note! The integration time defines the time for internal addition of the induced voltage in the fluid (tapped by the measuring electrode), in other words the time in which the measuring device registers true flow (after which the magnetic field is reversed for the next integration cycle).	x	x	o
POSITIVE ZERO RETURN (V8H3)	POSITIVE_ZERO_ RETURN	Use this parameter to interrupt evaluation of measured variables. This is necessary when a piping system is being cleaned, for example. The setting acts on all function and outputs of the measuring device. Options: OFF → normal signal output ON → signal output is set to "ZERO FLOW". Factory setting: OFF	x	x	o
SYSTEM_RESET (V8H5)	SYSTEM_RESET	Use this parameter to perform a reset of the measuring system. Options: NO RESTART SYSTEM (restart without interrupting line supply) Factory setting: NO	x	x	o

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SENSOR DATA (V9...)					
K-FACTOR_ POSITIVE (V9H0)	K_FACTOR_ POSITIVE	This function shows the current calibration factor (positive direction of flow) for the sensor. The calibration factor is calculated and set at the factory. Display: 5-digit fixed-point number: 0.5000 ...2.0000 Factory setting: depends on nominal diameter and calibration	X		O
K-FACTOR_ NEGATIVE (V9H1)	K_FACTOR_ NEGATIVE	This function shows the current calibration factor (negative direction of flow) for the sensor. The calibration factor is calculated and set at the factory. Display: 5-digit fixed-point number: 0.5000 ...2.0000 Factory setting: depends on nominal diameter and calibration	X		O
ZERO POINT (V9H2)	ZERO_POINT	This function shows the current zero-point correction value for the sensor. The zero-point correction factor is calculated and set at the factory. Display: max. 4-digit number: -1000 ...+1000 Factory setting: depends on nominal diameter and calibration	X		O
NOMINAL DIAMETER (V9H3)	NOMINAL_ DIAMETER	This function shows the nominal diameter for the sensor. The nominal diameter depends on the size of the sensor and is set at the factory. Display: 2 ...2000 mm or 1/12 ...78" Factory setting: depends on the size of the sensor	X		O
MEASURING PERIOD (V9H5)	MEASURING_ PERIOD	This is the parameter used to set the time for a full measuring period. If the setting is 0 ms the system automatically computes the shortest time. The duration of a measuring period is the sum of the rise time for the magnetic field, the short recovery time, the (parameterisable) integration time and the EPD time. Display: 0.0...1000 ms Factory setting: depends on nominal diameter  Note! The system checks the user input and sets the actual measuring period used internally to a plausible value.	X		O

Transducer block (device matrix)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SHOT TIME (V9H6)	SHOT_TIME	This is the parameter used to define the time in which overvoltage is applied to the coil circuit in order to build up the magnetic field as quickly as possible. The overvoltage time is adjusted automatically while measuring is in progress. The overvoltage time depends on the type of sensor and the nominal diameter and is set at the factory. Display: 4-digit floating-point number: 0.0...100.0 ms Factory setting: depends on nominal diameter	x		o
MEASURING POINT (VA...)					
TAG NAME (VAH0)	TAG_DESC	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name at the local display or by means of a class 2 master. User input: max. 32-character text, permissible: A-Z, 0-9, +, -, punctuation symbols Factory setting: "-----" (without text)	x	x	o
MATRIX_SELECTION (VAH5)	—	Use this parameter to switch from one matrix page to another.  Note! This parameter is of relevance in conjunction with Commuwin II only.	x	x	o
DEVICE_NAME (VAH6)	—	This parameter shows the device name.  Note! This parameter is of relevance in conjunction with Commuwin II only.	x		o

Transducer block (display functions)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
USER INTERFACE (V2...)					
ACCESS CODE (V2H0)	ACCESS_CODE	All data of the measuring system are protected against inadvertent change. Programming is disabled and the settings cannot be changed until a code is entered in this parameter. You can enable programing by entering your private code (default = 50, see the DEFINE_PRIVATE_CODE parameter). User input: max. 4-digit number: 0...9999  Note! • If write protection is enabled, access to the manufacturer-specific parameters is blocked even if the right code is entered. • You can also disable programming in this parameter by entering any number (other than the customer's code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.		x	o
DEFINE PRIVATE CODE (V2H1)	DEFINE_PRIVATE_CODE	Use this parameter to enter a personal code number for enabling programming. User input: 0...9999 (max. 4-digit number) Factory setting: 50  Note! • If the code number is "0", programming is always enabled. • Programming has to be enabled before this code can be changed. When programming is disabled the parameter is not available; this precaution prevents others from changing your personal code without your knowledge and consent.	x	x	o
STATUS ACCESS (V2H2)	STATUS_ACCESS	Use this parameter to check the access status for the manufacturer-specific parameters. Display: CUSTOMER (parameterisation enabled) SERVICE (parameterisation enabled) LOCKED (parameterisation disabled)	x		o

Transducer block (display functions)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
DISPLAY FUNCTION (V3...)					
LANGUAGE (V3H0)	HMI_LANGUAGE	Use this parameter to select the language for all texts and parameters shown on the display. Options: ENGLISH DEUTSCH FRANCAIS ESPANOL ITALIANO JAPANESE (syllabic) Factory setting: depends on country	x	x	o
DISPLAY DAMPING (V3H1)	HMI_DAMPING	Use this parameter to enter a time constant defining how the display reacts to severely fluctuating flow variables, either very quickly (enter a low time constant) or with damping (enter a high time constant). User input: 0...100 seconds Factory setting: 1 s  Note! Setting the time constant to zero seconds switches off damping.	x	x	o
CONTRAST LCD (V3H2)	HMI_LCD_CONTRAST	Use this parameter to optimise contrast on the local display to suit local operating conditions. User input: 10...100% Factory setting: 50%	x	x	o

Transducer block (display functions)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
MAIN LINE (V4...)					
ASSIGN_ LINE1 (V4H0)	HMI_ASSIGN_ LINE	Use this parameter to define the display value assigned to the main line (the top line of the local display) during normal measuring operation. Options: OFF VOLUME FLOW VOLUME FLOW IN % AI1 - OUT VALUE AO - DISP. VALUE TOT1 - OUT VALUE Factory setting: VOLUME FLOW	x	x	o
100% VALUE (V4H1)	HMI_100PC_ VALUE	 Note! This parameter is not available unless the ASSIGN_LINE1 or ASSIGN_LINE2 parameter is set to VOLUME FLOW IN %. Use this parameter to define the flow value to be shown on the display as the 100% value. User input: 5-digit floating-point number Factory setting: 10 l/s or 10 kg/s	x	x	o
FORMAT (V4H2)	HMI_FORMAT	Use this parameter to define the maximum number of places after the decimal point displayed for the reading in the main line. Options: XXXXX. - XXXX.X - XXX.XX - XX.XXX -X.XXXX Factory setting: X.XXXX  Note! - Note that this setting only affects the reading as it appears on the display, it has no influence on the accuracy of the system's calculations. - The places after the decimal point as computed by the measuring device cannot always be displayed, depending on this setting and the engineering unit. In these instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → kg/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.	x	x	o

Transducer block (display functions)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
ADDITIONAL LINE (V6...)					
ASSIGN_ LINE2 (V6H0)	HMI_ASSIGN_ LINE_ADD	Use this parameter to define the display value assigned to the additional line (the middle line of the local display) during normal measuring operation. Options: OFF VOLUME FLOW VOLUME FLOW IN % OPERATING/SYSTEM CONDITION FLOW DIRECTION VOLUME FLOW BARGRAPH IN % AI1 - OUT VALUE AO - DISP. VALUE TOT1 - OUT VALUE TAG NAME Factory setting: TOT1 - OUT VALUE (totalizer)	x	x	o
MEASURING POINT (VA...)					
TAG NAME (VAH0)	TAG_DESC	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name at the local display or by means of a class 2 master. User input: max. 32-character text, permissible: A-Z, 0-9, +, -, punctuation symbols Factory setting: "-----" (without text)	x	x	o
MATRIX_ SELECTION (VAH5)	—	Use this parameter to switch from one matrix page to another.  Note! This parameter is of relevance in conjunction with Commuwin II only.	x	x	o
DEVICE_NAME (VAH6)	—	This parameter shows the device name.  Note! This parameter is of relevance in conjunction with Commuwin II only.	x		o

Transducer block (SERVICE&ANALYSIS)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
DIAGNOSIS/ALARM (V0...)					
ACT. SYS. COND. (V0H0)	ACTUAL_ERROR_CODE	Use this function to check the present system status. Display: "SYSTEM OK" or the system/process error message with the highest priority.  Note! Meanings, causes and troubleshooting routines are explained in the Operating Instructions <i>promag 50</i>, BA 055D/06/en/.	x		o
PREV. SYS. COND. (V0H1)	—	 Note! This function is not available at this time. Use this function to view the fifteen most recent system and process error messages since measuring last started. Display shows: the 15 most recent error or status messages  Note! The display can be reset manually using the OLD ERR RESET parameter.	x		o
PREV. SYS. RESET (V0H2)	—	 Note! This function is not available at this time. Use this function to delete the list of system and error messages in the OLD ERR CODE parameter. Options: YES NO	x	x	o
ALARM_DELAY (V0H3)	ALARM_DELAY	Use this parameter to define a time for the suppression of system and process error messages. Depending on the setting and the type of error, this suppression acts on: • Display • PROFIBUS-PA communication output User input: 0...100 s (in steps of one second) Factory setting: 0 s  Caution: If this parameter is activated, system and process error messages are delayed by the time corresponding to the setting before being forwarded to the higher-order controller (process controller, etc.). It is therefore imperative to check in advance in order to make sure whether a delay of this nature could affect the safety requirements of the process. If system and process error messages cannot be suppressed, a value of 0 seconds must be entered here.	x	x	o

Transducer block (SERVICE&ANALYSIS)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
USER INTERFACE (V2...)					
ACCESS CODE (V2H0)	ACCESS_CODE	All data of the measuring system are protected against inadvertent change. Programming is disabled and the settings cannot be changed until a code is entered in this parameter. You can enable programming by entering your private code (default = 50, see the DEFINE_PRIVATE_CODE parameter). User input: max. 4-digit number: 0...9999  Note! • If write protection is enabled, access to the manufacturer-specific parameters is blocked even if the right code is entered. • You can also disable programming in this parameter by entering any number (other than the customer's code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.		X	O
DEFINE PRIVATE CODE (V2H1)	DEFINE_PRIVATE_CODE	Use this parameter to enter a personal code number for enabling programming. User input: 0...9999 (max. 4-digit number) Factory setting: 50  Note! • If the code number is "0", programming is always enabled. • Programming has to be enabled before this code can be changed. When programming is disabled the parameter is not available; this precaution prevents others from changing your personal code without your knowledge and consent.	X	X	O
STATUS_ACCESS (V2H2)	STATUS_ACCESS	Use this parameter to check the access status for the manufacturer-specific parameters. Display: CUSTOMER (parameterisation enabled) SERVICE (parameterisation enabled) LOCKED (parameterisation disabled)	X		O

Transducer block (SERVICE&ANALYSIS)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SIMULATION (V4...)					
SIM. MEASURAND (V4H0)	SIMULATION_ MEASURAND	Use this parameter to simulate the output of the Transducer block as a way of testing response. During this time, the words "SIMULATION VOLUME FLOW" appear on the local display. Simulation affects the AI (Analog Input) block and the TOT (totalizer) block. Options: OFF VOLUME FLOW Factory setting: OFF  Note! If you want to display the unit of the simulated measured value, you can use the SET_UNIT_TO _BUS parameter (see Page 50) to send the selected system unit, which has a direct relationship to measured-value scaling, to the process control system. This is also possible in the TOT (totalizer) block, in which case the parameter to use is UNIT_TOT (see Page 89). In the AI (Analog Input) block you can use the OUT_UNIT parameter (see Page 76) to select a unit which, however, has no effect on measured-value scaling.  Caution: • The measuring device cannot be used for measuring while this simulation is in progress. • The setting is not saved if the power supply fails.	x	x	o
VALUE_SIM. MEASURAND (V4H1)	VALUE_ SIMULATION_ MEASURAND	 Note! The parameter is not visible unless the SIMULATION MEASURAND parameter is active. Use this parameter to define a selectable value (e.g. 12 m³/s). This is used to test the associated parameters in the flowmeter itself and downstream signal loops. User input: 5-digit floating-point number Factory setting: 0  Caution: The setting is not saved if the power supply fails.	x	x	o

Transducer block (SERVICE&ANALYSIS)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
SIM. FAILSAFE MODE (V4H2)	SIM_FSAFE_ MODE	Use this parameter to simulate the error response of the Transducer block. Options: OFF NO Factory setting: OFF  Note! The error response of the function blocks must be defined in the AI (Analog Input) function block or the TOT (totalizer) function block (see the function description of the function block in question).	x	x	o
SENSOR_INFO (V6...)					
SERIAL NUMBER (V6H0)	SERIAL_NUM	Use this function to view the serial number of the sensor.	x		o
SENSOR_TYPE (V6H1)	SENSOR_TYPE	Use this function to view the sensor type.	x		o
HW REV. SENSOR (V6H2)	HW_REV_SEN SO R	Use this function to view the hardware revision number of the sensor.	x		o
SW REV.S-DAT (V6H5)	SW_REV_S_DAT	Use this function to view the software revision number of the software used to create the content of the S-DAT.	x		o
AMPLIFIER_INFO (V7...)					
HW REV. AMP. (V7H0)	HW_REV_AMP	Use this function to view the hardware revision number of the amplifier.	x		o
SW.REV. AMP. (V7H2)	SW_REV_AMP	Use this function to view the software revision number of the amplifier.	x		o
SW REV.T-DAT (V7H5)	SW_REV_T_DAT	Use this parameter to view the software revision number of the software used to create the content of the T-DAT.	x		o
I/O_MODULE_INFO (V8...)					
I/O_TYPE (V8H0)	IO_TYPE	Use this function to view the configuration of the I/O module complete with terminal numbers.  Note! This function is not available at this time.	x		o
HW REV.I/O (V8H1)	HW_REV_IO	Use this function to view the hardware revision number of the I/O module.	x		o
SW REV.I/O (V8H3)	SW_REV_IO	Use this function to view the software revision number of the I/O module.	x		o

Transducer block (SERVICE&ANALYSIS)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
MEASURING POINT (VA...)					
TAG NAME (VAH0)	TAG_DESC	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name at the local display or by means of a class 2 master. User input: max. 32-character text, permissible: A-Z, 0-9, +,-, punctuation symbols Factory setting: "-----" (without text)	x	x	o
MATRIX SELECTION (VAH5)	—	Use this parameter to switch from one matrix page to another.  Note! This parameter is of relevance in conjunction with Commuwin II only.	x	x	o
DEVICE_NAME (VAH6)	—	This parameter shows the device name.  Note! This parameter is of relevance in conjunction with Commuwin II only.	x		o

Transducer block (use of the Profile parameters)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
VOLUME_FLOW (V0...)					
VOLUME_FLOW (V0H0)	VOLUME_FLOW	Displays the current measured value of the process variable (volume flow) made available to the Analog Input 1 function block as an input value. Display: 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm ³ /min; 1.4359 m ³ /h; etc.)	X		M
STATUS (V0H1)	VOLUME_FLOW	Displays the current status of the process variable (volume flow) made available to the Analog Input 1 function block as an input value.	X		M
UNIT (V0H2)	VOLUME_FLOW_ UNITS	Use this parameter to select the unit for the volume flow. Options: l/s m ³ /h gal/min ft ³ /min Factory setting: m ³ /h  Note! Only the units defined in the 3.0 profiles are available.	X	X	M
LOWER_RANGE_ VALUE (V0H3)	VOLUME_FLOW_ LO_LIM	Use this parameter to enter the measuring device's lower range value for volume flow.	X	X	M
UPPER_RANGE_ VALUE (V0H4)	VOLUME_FLOW_ HI_LIM	Use this parameter to enter the measuring device's upper range value for volume flow.	X	X	M
SAMPLING_FREQ. (V6...)					
VOLUME_FLOW (V6H0)	SAMPLING_FREQ	Use this function to view the sampling frequency of the measuring device.	X		M
STATUS (V6H1)	SAMPLING_FREQ	Use this function to view the status of the sampling frequency.	X		M
UNIT (V6H2)	SAMPL_FREQ_ UNIT	Use this parameter to select the unit for the sampling frequency. Options: Hz Factory setting: Hz	X	X	M

Transducer block						
(use of the Profile parameters)						
Matrix text		Parameter				
(Commuwin II)	(SLOT/INDEX)	Description	R	W	P	
SYSTEM_PARAMETERS (V7...)						
MEASURING_ MODE (V7H0)	MEASURE_MODE	Use this parameter to set the flow mode as bidirectional or unidirectional. Options: UNIDIRECTIONAL BIDIRECTIONAL Factory setting: BIDIRECTIONAL	X	X	M	
FLOW_ DIRECTION (V7H1)	FLOW_DIRECTION	Use this parameter to set the direction of flow. Options: POSITIVE NEGATIVE Factory setting: POSITIVE	X	X	M	
LOW_FLOW_ CUTOFF (V7H2)	LOW_FLOW_ CUTOFF	Use this parameter to assign a value to the switch-on point for low flow cut off. If you enter a value not equal to 0 low flow cut off is enabled and the sign of the flow value is high-lighted on the local display. User input: 5-digit floating-point number Factory setting: 0.0000	X	X	M	
ZERO_POINT (V7H3)	ZERO_POINT	This function shows the current zero-point correction value for the sensor. The zero-point-correction factor is calculated and set at the factory. Display: max. 4-digit number: -1000 ...+1000 Factory setting: depends on nominal diameter and calibration	X	X	M	
ZERO_POINT_ ADJUST (V7H4)	ZERO_POINT_ ADJUST	Use this parameter to activate zero point adjustment. Options: CANCEL EXECUTE Factory setting: CANCEL	X	X	M	
UNIT (V7H5)	ZERO_POINT_ UNIT	Use this parameter to select the unit for zero point adjustment. Options: mm/s Factory setting: mm/s	X	X	M	

Transducer block (use of the Profile parameters)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
CALIB_FACTOR (V7H6)	CALIBR_FACTOR	Use this parameter to enter the calibration factor. User input: 5-digit fixed-point number: 0.5000 ...2.0000 Factory setting: depends on nominal diameter and calibration  Caution: Do not change this value, because a change will inevitably affect the accuracy of the measuring device.	X	X	M
NOMINAL_SIZE (V7H7)	NOMINAL_SIZE	You can use this parameter to enter the nominal diameter of the measuring device. User input: 2 ...2000 mm or 1/12 ...78" Factory setting: depends on the size of the sensor	X	X	M
UNIT (V7H8)	NOMINAL_SIZE_UNIT	You can use this parameter to select the unit of the nominal diameter. Options: MM – INCH Factory setting: MM	X	X	M
BLOCK_MODE (V8...)	General information on the MODE_BLK parameter group: There are three elements in this parameter group: • the current operating mode of the block (Actual_Mode) • the modes supported by the block (Permitted_Mode) • the normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the out-of-service mode (O/S). A function block generally offers a choice of operating modes, whereas the other block types support only the AUTO mode, for example.				
TARGET_MODE (V8H0)	TARGET_MODE	The selected operating mode. Only the automatic mode can be selected for the Transducer block. Options: AUTO Factory setting: AUTO	X	X	M
ACTUAL (V8H1)	MODE_BLK (ACTUAL)	Displays the current operating mode. Display: AUTO	X		M
NORMAL (V8H2)	MODE_BLK (NORMAL)	Displays the operating mode for normal operation. Display: AUTO	X		M
PERMITTED (V8H3)	MODE_BLK (PERMITTED)	Displays the permissible operating modes. Display: AUTO	X		M

Transducer block					
(use of the Profile parameters)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
UNIT_MODE (V8H7)	—	Use this parameter to select the form in which you want the units displayed. In the list mode the units are displayed with the conventional abbreviations, for example: L/s. In the number mode the units are displayed in the numerical code defined in the 3.0 profiles, for example: 1351 (L/s).	X	X	O
ALARM_CONFIG (V9...)	General information on the ALARM_CONFIG parameter group: The block supported is the Active Block Alarm, which flags a change in a parameter with static values (Static attribute) for 10 seconds and indicates that an warning limit or an alarm limit has been violated in an Analog Input function block.				
CURRENT (V9H0)	ALARM_-SUMMARY (CURRENT)	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1)	ALARM_-SUMMARY (DISABLE)	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M
UNACKNOWLEDGED (V9H2)	ALARM_-SUMMARY (UNACKNOWLEDGED)	 Note! This parameter is not available in this profile version.			
UNREPORTED (V9H3)	ALARM_-SUMMARY (UNREPORTED)	 Note! This parameter is not available in this profile version.			
ST_REVISION (V9H5)	ST_REV	A block has static parameters (Static attribute) that are not changed by the process. Static parameters with values that change during optimisation or configuration increment the ST_REV parameter by 1. This supports parameter-revision management. The Static Revision Counter can show a higher value if several parameters change within a very short period of time, for example when parameters are uploaded to the measuring device from Commuwin II. This counter is never reset, nor does it return to a default setting even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X		M
BLOCK_PARAMETERS (VA...)					
TAG (VAH0)	TAG_DESC	Entry of a user-specific text of max. 32 characters for unique identification and assignment of the block. Factory setting: "-----" without text	X	X	M
STRATEGY (VAH1)	STRATEGY	Parameter for grouping and thus faster evaluation of blocks. Grouping is carried out by entering the same numerical value in the parameter STRATEGY for each individual block. Factory setting: 0	X	X	M

Transducer block (use of the Profile parameters)					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
ALERT_KEY (VAH2)	ALERT_KEY	Entry of the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. User input: 1...255 Factory setting: 0	x	x	M
PROFILE_VERSION (VAH3)	—	Displays the profile version implemented in the device. Display: 30	x		M

4 Function blocks, general

The function blocks contain the basic automation functions of the measuring device. We distinguish between different function blocks, e.g. Analog Input function block, Analog Output function block, Totalizer block, etc.

Each of these function blocks is used to execute different application functions.

This means that device errors such as amplifier errors are reported to the process control system automatically.

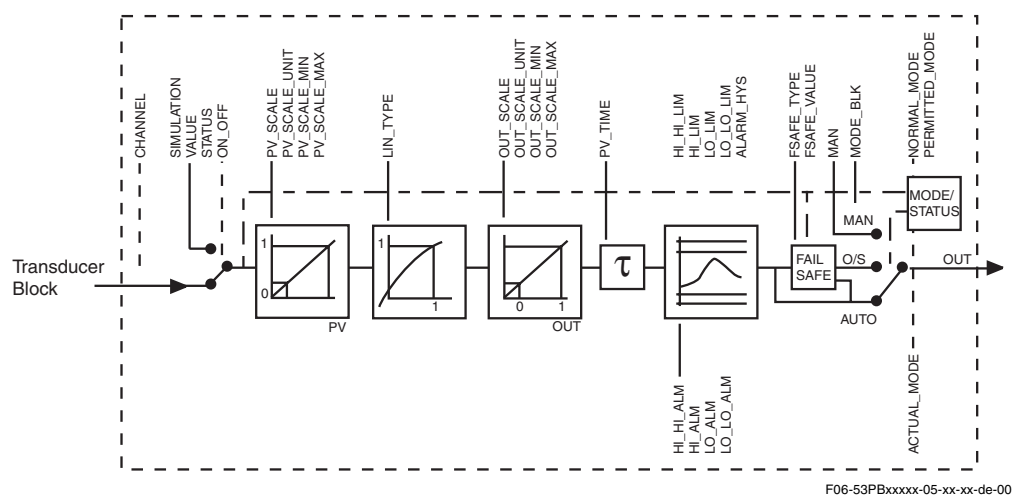
The function blocks process the input values in accordance with their specific algorithm and their internally available parameters. They generate output values that are then made available to the process-control system for further processing.

5 Analog Input function block

In the Analog Input function block, the process variable (volume flow) is prepared by the Transducer block for the subsequent automation functions (e.g. scaling, limit value processing). The Promag 50 PROFIBUS-PA has one Analog Input function block.

5.1 Signal processing

The figure shows the internal structure of an Analog Input function block:



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The Analog Input function block receives its input value from the Transducer block (the measured variable is volume flow). This input value is permanently assigned to the Analog Input function block and cannot be changed.

The parameter group SIMULATE (see Page 80) allows you to replace the input value with a simulation value and to activate simulation. By specifying the status and the simulation value the reaction of the process-control system can be tested.

In the PV_FTIME parameter (see Page 77) a filter time can be specified for damping the converted primary value (PV). When a time of 0 seconds is specified, the input value is not damped.

The BLOCK_MODE parameter group (see Page 81) is used to select the operating mode of the Analog Input function block. If the MAN (manual) operating mode is selected, the output value OUT and the OUT status (see Page 74) can be specified directly.

The output value OUT is compared with warning and alarm limits (e.g. HI_LIM, LO_LO_LIM, etc.) that can be entered via various parameters. If one of these limit values is violated then a limit value process alarm (e.g. HI_ALM, LO_LO_ALM, etc.) is triggered.

The major functions and parameters of the Analog Input function block are listed below; you will find an overview of all the available parameters starting on Page 74.

5.2 Selecting the operating mode

The operating mode is set by means of the BLOCK_MODE parameter group (see Page 81). The Analog Input function block supports the following operating modes:

- AUTO (automatic mode)
- MAN (manual mode)
- O/S (out of service)

5.3 Selecting the units

The system unit for volume flow can be changed by means of the local display or by Commuwin II in the Transducer block profile and the manufacturer-specific device block.

Changing the unit does not initially have any effect on the measured value transmitted to the process-control system. This ensures that there are no sudden changes in the measured values that could have an adverse effect on the subsequent control routine. If you want a change of unit to affect the measured value, you can activate the SET_UNIT_TO_BUS function (manufacturer-specific, see Page 50) by means of the local display or by Commuwin II.

Another way of changing the unit is to use the PV SCALE and OUT SCALE parameters (see Page 72 "Rescaling the input value").

5.4 Status of the OUT value

The status of the parameter group OUT communicates to the subsequent function blocks the status of the Analog Input function block and the validity of the output value OUT. The following status values can be displayed:

- GOOD_NON_CASCADE
The output value OUT is valid and can be used for further processing.
- Uncertain
The output value OUT can only be used for further processing to a limited extent.
- BAD
The output value OUT is invalid. Occurs when the Analog Input function block is switched to O/S (Out of Service) or in the event of serious errors (see the sections dealing with status code and system/process error messages in the Operating Instructions *Promag 50*, BA 055D/06/en/).

5.5 Simulation of the input and output

Various parameters of the Analog Input function block allow simulation of the input and output of the function block:

1. Simulation of the input of the Analog Input function block:
The SIMULATION parameter group (see Page 80) can be used to specify the input value (measured value and status). Since the simulation value runs through the entire function block, all the parameter settings of the block can be checked.
2. Simulation of the output of the Analog Input function block:
Set the operating mode in the parameter group MODE_BLK (see Page 81) to MAN and specify the desired output value directly in the parameter OUT (see Page 74).

5.6 Error response (FAILSAFE_TYPE)

If an input or simulation value is statused BAD, the Analog Input function block uses the response defined in the FAILSAFE_TYPE parameter. The FAILSAFE_TYPE parameter (see Page 75) offers the following options:

- FSAFE VALUE
The value defined in the FAILSAFE_VALUE parameter (see Page 75) is used for processing.
- LAST GOOD VALUE
The last good value is used for processing.
- WRONG VALUE
The current value is used for processing, despite the BAD status.

The default is the setting (FSAFE VALUE) with value "0".



Note!

Error response is also activated if the Analog Input function block is switched to OUT OF SERVICE.

5.7 Scaling the input value

In the Analog Input function block the input value or input range can be scaled in accordance with the automation requirements.

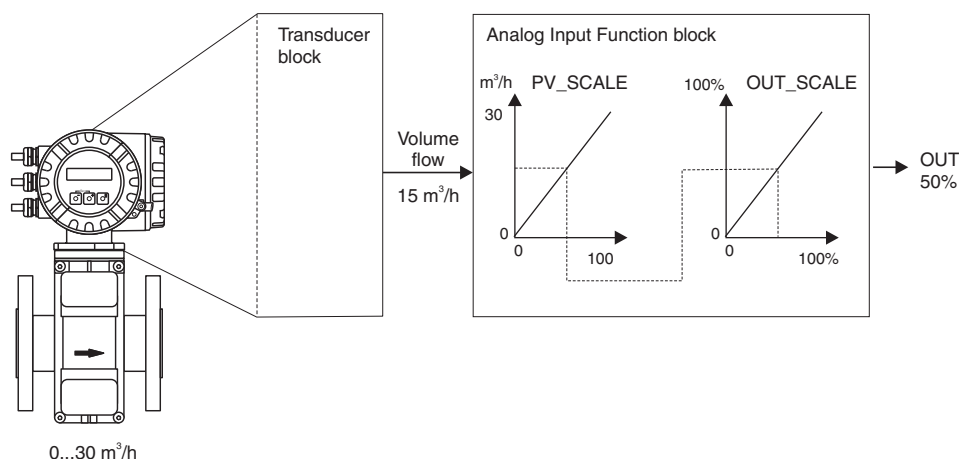
Example:

- The system unit in the Transducer block is m^3/h
- The measurement range of the device is $0 \dots 30 \text{ m}^3/\text{h}$.
- The output range to the process control system should be $0 \dots 100\%$.
- The measured value from the Transducer block (input value) is scaled linearly with the PV_SCALE input scaling to the desired output range OUT_SCALE.
- Parameter group PV_SCALE (see Page 75)

PV_SCALE_MIN (V1H0)	= 0
PV_SCALE_MAX (V1H1)	= 30
- Parameter group OUT_SCALE (see Page 76)

OUT_SCALE_MIN (V1H3)	= 0
OUT_SCALE_MAX (V1H4)	= 100
OUT_UNIT (V1H5)	= %

The result is that with an input value of, for example, 15 m³/h a value of 50% is output by the OUT parameter.



Note!

The "OUT_UNIT" has no effect on scaling. It should be set nevertheless, for the purposes of viewing on the local display, for example.

5.8 Limit values

You can set two warning limits and two alarm limits for monitoring your process. The status of the measured value and the parameters of the limit-value alarms are indicative of the measured value's relative position. You also have the option of defining an alarm hysteresis in order to avoid frequent changes of the limit-value flags and frequent enabling/disabling of alarms (see Page 78).

The limit values are based on the output value OUT. If the output value OUT exceeds or does not reach the defined limit values, an alarm is sent to the process-control system via the limit value process alarms.

The following limit values can be defined:

- | | | | |
|-------------|---------------|----------|---------------|
| – HI_HI_LIM | (see Page 79) | – HI_LIM | (see Page 79) |
| – LO_LO_LIM | (see Page 80) | – LO_LIM | (see Page 79) |

5.9 Alarm detection and processing

The following process alarms are generated by the Analog Input function block:

• Limit value process alarms

The status of the limit value process alarms is communicated to the process-control system by means of the following parameters:

- | | | | |
|-------------|---------------|----------|---------------|
| – HI_HI_ALM | (see Page 79) | – HI_ALM | (see Page 79) |
| – LO_LO_ALM | (see Page 80) | – LO_ALM | (see Page 79) |

5.10 Parameters, Analog Input function block

The following table shows all the available parameters of the Analog Input function block.

Abbreviations used in the table:

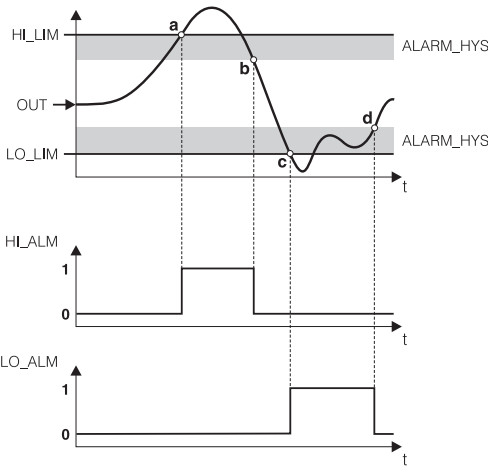
- R = Read
- W = Write
- P = Parameter, with a distinction between:
 - M = "Mandatory" (obligatory) parameter
 - O = Optional parameter

Analog Input function block						
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P	
OUT (V0...)						
OUT_VALUE (V0H0)	OUT (VALUE)	Displays the output value with alarm weighting.  Note! If MAN (manual) is selected for the operating mode in the MODE_BLK parameter group, the output value OUT can be specified manually here.	X	X	M	
OUT_STATUS (V0H1)	OUT (STATUS)	Displays the current output status.  Note! If MAN (manual) is selected for the operating mode in the MODE_BLK parameter group, the status of the OUT output value can be specified manually here.	X	X	M	
OUT_STATUS (V0H2)	OUT (STATUS BIT 0-1)	Displays the quality of the output status. Display: GOOD UNCERTAIN BAD	X		M	
OUT_SUB_STATUS (V0H3)	OUT (STATUS BIT 2-5)	Displays the substatus in plain text.	X		M	
OUT_LIMIT (V0H4)	OUT (LIMITS BIT 6-7)	Displays the limit overshoot in plain text. Display: O.K. → no limit overshoot HIGH LIMIT → HI LIMIT or/and HI HI LIMIT overshoot LO LIMIT → LO LIMIT or/and LO LO LIMIT undershoot	X		M	

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
FAILSAFE_ACTION (V0H6)	FAILSAFE_TYPE	Use this parameter to define error response in the event of a device error or bad measured value. The ACTUAL MODE (the block's current operating mode) remains in AUTO (automatic). Options: • FSAFE VALUE If you select this option the value entered beforehand in the FSAFE_VALUE parameter is displayed in OUT (output value). Status changes to UNCERTAIN - SUBSTITUTE VALUE. • LAST GOOD VALUE The last good value prior to the failure is used. Status is set to UNCERTAIN – LAST USABLE VALUE. If no prior usable value is available, the initial value is returned and statused UNCERTAIN – INITIAL VALUE (for values that were not saved on the occasion of a device reset). The initial value of the Promag 50 is "0". • WRONG VALUE The current value is used for processing, despite the bad status. Factory setting: FSAFE VALUE	x	x	0
FAILSAFE_VALUE (V0H7)	FAILSAFE_VALUE	You can use this parameter to define a default that will be displayed in OUT (output value) in the event of an error (see FAILSAFE_TYPE). Factory setting: 0	x	x	0
SCALING (V1...)	In this PV_SCALE parameter group, the process variable is normalised to a value with the unit of the Transducer block, with the aid of the EU OF 0 and EU OF 100 parameters. The change of unit in the Transducer block also causes an automatic change in the scaling for the EU OF 0 and EU OF 100 parameters. This prevents OUT jumping. You will find an example of rescaling the input value on Page 72.				
PV_SCALE_MIN (V1H0)	EU OF 0	Use this parameter to select the lower value for input scaling. Factory setting: 0	x	x	M
PV_SCALE_MAX (V1H1)	EU OF 100	Use this parameter to select the upper value for input scaling. Factory setting: 100	x	x	M
TYPE OF LIN (V1H2)	LIN_TYPE	Use this parameter to select a characteristic line to be used in characteristic-line transformation.  Note! You cannot select linearisation with the Promag 50.	x	x	M

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
OUT_SCALE		The OUT_SCALE parameter group is where you define the measuring range (lower and upper limits), and the physical unit for the output value (OUT).  Note! Defining the measurement range in this parameter group does not restrict the output value OUT. If the output value OUT is outside the measurement range, this value is transferred anyway.			
OUT_SCALE_MIN (V1H3)	EU OF 0%	Use this parameter to select the lower value for output scaling. Factory setting: 0	X	X	M
OUT_SCALE_MAX (V1H4)	EU OF 100%	Use this parameter to select the upper value for output scaling. Factory setting: 100	X	X	M
OUT_UNIT (V1H5)	OUT_SCALE	Use this parameter to select the output unit. Factory setting: Analog Input function block 1 = m³/h Analog Input function block 2 = kg/h  Note! OUT_UNIT (output unit) has no effect on measured-value scaling.	X	X	M
USER_UNIT (V1H6)	OUT_UNIT_TEXT	You can use this parameter to enter an ASCII text if the unit you want is not available in the OUT_UNIT (output unit) parameter. Factory setting: (_ _ _) without text  Note! Note that you cannot enter text here unless USER_UNIT is selected in the OUT_UNIT parameter.	X	X	M
DEC_POINT_OUT (V1H7)	OUT_SCALE	Use this parameter to define the decimal places of the OUT value.  Note! This parameter is not supported by the Promag 50.	X	X	M

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
RISING_TIME (V1H8)	PV_FTIME	Entry of the filter time constant (in seconds) of the digital filter of the 1st order. This time is required in order for 63% of a change in the analog input (input value) to have an effect on OUT (output value). The diagram shows the signal curves of the Analog Input function block over time: A → The analog input changes. B → The OUT (output value) has reacted 63% to the change in the analog input. Factory setting: 0 s	X	X	M

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
ALARM_LIMITS (V2...)					
ALARM_ HYSTERESIS (V2H0)	ALARM_HYS	For entry of the hysteresis value for the upper and lower warning or alarm limit values. The alarm conditions remain active so long as the measured value is within the hysteresis. The hysteresis value affects the following warning and alarm limit values of the AI function block: HI_HI_ALM → upper limit-value alarm HI_ALM → upper limit value warning LO_LO_ALM → lower limit-value alarm LO_ALM → lower limit value warning User input: 0...50% Factory setting: 0.5%  Note! • The hysteresis value relates to a percentage of the range of the parameter group OUT_SCALE in the Analog Input function block (see Page 76). • If you enter the limit values in Commuwin II, it is important to make sure that absolute values can be entered and displayed. Example: The top diagram shows the limit values defined for the warnings LO_LIM and HI_LIM with their respective hystereses (gray background) and the signal curve of the output value OUT. The bottom two diagrams show the behaviour of the associated alarms HI_ALM and LO_ALM in relation to the changing signal curve (0 = no alarm, 1 = alarm output). a → OUT output value exceeds the HI_LIM limit value, HI_ALM is activated. b → OUT output value is below the hysteresis value of HI_LIM, HI_ALM is deactivated. d → OUT output value is below the LO_LIM limit value, LO_ALM is activated. e → OUT output value is above the hysteresis value of LO_LIM, LO_ALM is deactivated. 	X	X	M

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Analog Input function block						
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P	
HI_HI_ALARM (V3...)						
HI_HI_LIM (V3H0)	HI_HI_LIM	Entry of the alarm limit value for the upper alarm (HI_HI_ALM). If the output value OUT exceeds this limit value then the alarm status parameter HI_HI_ALM is output. User input: Range and unit of OUT_SCALE Factory setting: 3402823466 x 10 ³⁸	X	X		M
VALUE (V3H1)	HI_HI_ALM (VALUE)	Alarm-status parameter for the upper alarm limit. Content includes the value that violated the limit.	X			O
ALARM_STATE (V3H2)	HI_HI_ALM (ALARM_STATE)	Use this parameter to view the current status of the HI_HI_ALARM.	X			O
SWITCH-ON_POINT (V3H3)	HI_HI_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	X			O
SWITCH-OFF_POINT (V3H4)	HI_HI_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	X			O
HI_ALARM (V4...)						
HI_LIM (V4H0)	HI_LIM	Entry of the alarm limit value for the upper warning (HI_ALM). If the output value OUT exceeds this limit value then the alarm status parameter HI_ALM is output. User input: Range and unit of OUT_SCALE Factory setting: 3402823466 x 10 ³⁸	X	X		M
VALUE (V4H1)	HI_ALM (VALUE)	Alarm-status parameter for the upper warning limit. Content includes the value that violated the limit.	X			O
ALARM_STATE (V4H2)	HI_ALM (ALARM_STATE)	Use this parameter to view the current status of the HI_ALARM.	X			O
SWITCH-ON_POINT (V4H3)	HI_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	X			O
SWITCH-OFF_POINT (V4H4)	HI_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	X			O
LO_ALARM (V5...)						
LO_LIM (V5H0)	LO_LIM	Entry of the alarm limit value for the lower warning (LO_ALM). If the output value OUT is below this limit value then the alarm status parameter LO_ALM is output. User input: Range and unit of OUT_SCALE Factory setting: 3402823466 x 10 ³⁸	X	X		M
VALUE (V5H1)	LO_ALM (VALUE)	Alarm-status parameter for the lower warning limit. Content includes the value that violated the limit.	X			O

Analog Input function block						
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P	
ALARM_STATE (V5H2)	LO_ALM (ALARM_STATE)	Use this parameter to view the current status of the LO_ALARM.	X		O	
SWITCH-ON_POINT (V5H3)	LO_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	X		O	
SWITCH-OFF_POINT (V5H4)	LO_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	X		O	
LO_LO_ALARM (V6...)						
LO_LO_LIM (V6H0)	LO_LO_LIM	Entry of the alarm limit value for the lower alarm (LO_LO_ALM). If the output value OUT is below this limit value then the alarm status parameter LO_LO_ALM is output. User input: Range and unit of OUT_SCALE Factory setting: 3402823466 x 10 ³⁸	X	X	M	
VALUE (V6H1)	LO_LO_ALM (VALUE)	Alarm-status parameter for the lower alarm limit. Content includes the value that violated the limit.	X		O	
ALARM_STATE (V6H2)	LO_LO_ALM (ALARM_STATE)	Use this parameter to view the current status of the LO_LO_ALARM.	X		O	
SWITCH-ON_POINT (V6H3)	LO_LO_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	X		O	
SWITCH-OFF_POINT (V6H4)	LO_LO_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	X		O	
SIMULATION (V7...)						
SIMULATION_VALUE (V7H0)	SIMULATE	Simulation of the input value and input status. Since this value runs through the entire algorithm, the behaviour of the Analog Input function block can be checked. Factory setting: Simulation Disabled	X	X	O	
SIMULATION_STATUS (V7H1)	SIMULATE (STATUS)	Use this parameter to simulate the status of the Analog Input (AI) block.	X	X	O	
SIMULATION_MODE (V7H2)	SIMULATE (MODE)	Use this parameter to activate simulation of the Analog Input function block. User input: OFF ON Factory setting: OFF	X	X	O	

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
BLOCK_MODE (V8...)	General information on the MODE_BLK parameter group: There are three elements in this parameter group: - the current operating mode of the block (Actual_Mode) - the modes supported by the block (Permitted_Mode) - the normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the out-of-service mode (O/S). A function block generally offers a choice of operating modes, whereas the other block types support only the AUTO mode, for example.				
TARGET_MODE (V8H0)	TARGET_MODE	Select the operating mode. Options: AUTO MAN O/S Factory setting: AUTO	X	X	M
ACTUAL (V8H1)	MODE_BLK (ACTUAL)	Displays the current operating mode. Display: AUTO	X		M
NORMAL (V8H2)	MODE_BLK (NORMAL)	Displays the operating mode for normal operation. Display: AUTO	X		M
PERMITTED (V8H3)	MODE_BLK (PERMITTED)	Displays the permissible operating modes. Display: AUTO	X		M
CHANNEL (V8H5)	CHANNEL	Use this parameter for assignment between the logical hardware channel of the Transducer block and the input of the Analog Input function block. The Transducer block of the Promag 50 provides one process variable for the input channel of the Analog Input function block. It is: AI 1 (Analog Input 1) → Volume flow  Note! The Promag 50 channel is permanently assigned and this assignment cannot be modified with the Channel parameter.	X	X	M
UNIT_MODE (V8H7)	—	Use this parameter to select the form in which you want the units displayed. In the list mode the units are displayed with the conventional abbreviations, for example: L/s. In the number mode the units are displayed in the numerical code defined in the 3.0 profiles, for example: 1351 (L/s).	X	X	O

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
ALARM_CONFIG (V9...)	General information on the ALARM_CONFIG parameter group: The block supported is the Active Block Alarm, which flags a change in a parameter with static values (Static attribute) for 10 seconds and indicates that an warning limit or an alarm limit has been violated in an Analog Input function block.				
CURRENT (V9H0)	ALARM_SUMMARY (CURRENT)	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1)	ALARM_SUMMARY (DISABLE)	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M
UNACKNOWLEDGED (V9H2)	ALARM_SUMMARY (UNACKNOWLEDGED)	 Note! This parameter is not available in this profile version.			
UNREPORTED (V9H3)	ALARM_SUMMARY (UNREPORTED)	 Note! This parameter is not available in this profile version.			
ST_REVISION (V9H5)	ST_REV	A block has static parameters (Static attribute) that are not changed by the process. Static parameters with values that change during optimisation or configuration increment the ST_REV parameter by 1. This supports parameter-revision management. The Static Revision Counter can show a higher value if several parameters change within a very short period of time, for example when parameters are uploaded to the measuring device from Commuwin II. This counter is never reset, nor does it return to a default setting even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X		M
BLOCK_PARAMETER (VA...)					
TAG (VAH0)	TAG_DESC	Entry of a user-specific text of max. 32 characters for unique identification and assignment of the block. Factory setting: " _ _ _ _ _ _ _ _ " without text	X	X	M
STRATEGY (VAH1)	STRATEGY	Parameter for grouping and thus faster evaluation of blocks. Grouping is carried out by entering the same numerical value in the parameter STRATEGY for each individual block. Factory setting: 0	X	X	M
ALERT_KEY (VAH2)	ALERT_KEY	Entry of the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. User input: 1...255 Factory setting: 0	X	X	M

Analog Input function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
PROFILE_VERSION (VAH3)	—	Displays the profile version implemented in the device. Display: 30	x		o
BATCH (VAH4-7)	Batch is a structured parameter consisting of four elements. This parameter is used in batch applications compliant with IEC 61512 Part 1 (ISA S88). Only function blocks include this parameter. There is no algorithm linked to this parameter within a function block. The Batch parameter is necessary in a distributed process-control system as a means of flagging the channels that are used. It can also be used to view errors that have occurred in the current batch process.				
BATCH_ID (VAH4)	BATCH (ID)	ID of a batch application as a means of assigning device messages (alarms, errors).	x	x	M
BATCH_RUP (VAH5)	BATCH (RUP)	This parameter can contain the code for a recipe needed for the batch application, or the unit, such as reactors.	x	x	M
BATCH_PHASE (VAH6)	BATCH (PHASE)	Use this parameter to write or show the current recipe phase.	x	x	M
BATCH_OPERATION (VAH7)	BATCH (OPERATION)	Use this parameter to write or show the current recipe.	x	x	M

6 Totalizer function block

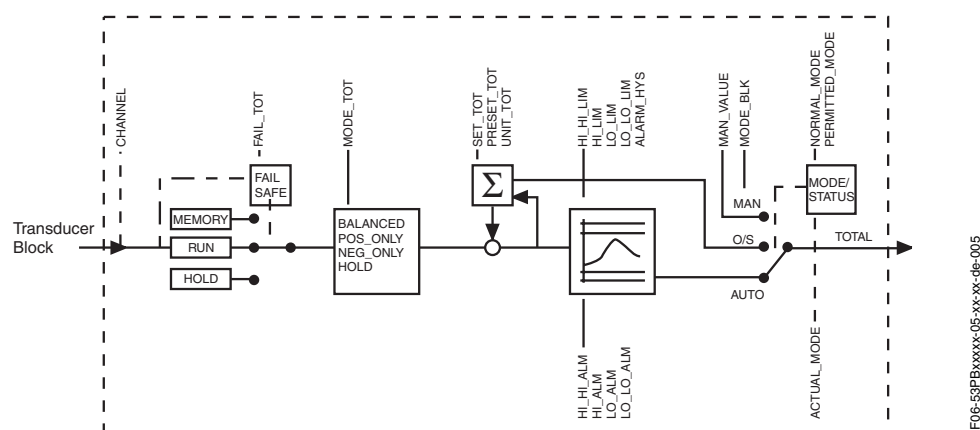
The Totalizer function block is used whenever a physical measured variable, generally flow, has to be totaled over a period of time.

In the case of the Promag 50 PROFIBUS-PA, the variable is volume flow.

Like the Analog Input function block, the Totalizer function block receives its input value (the volume flow measured variable) from a Transducer block.

6.1 Signal processing

The figure shows the internal structure of a Totalizer function block.



The Totalizer function block receives its input value (the measured variable is volume flow) from the Transducer function block.

The CHANNEL parameter (see Page 93) is used to select whether the input value will be processed by the Totalizer function block. The following settings can be made with Commuwin II and the local display:

- Local display:
 - OFF
 - VOLUME FLOW
- Commuwin II:
 - 273 (volume flow) = default

The MODE_BLK parameter group (Page 92) is used to select the operating mode of the Totalizer function block. If the MAN (manual) operating mode is selected, the TOTAL output value and the TOTAL_STATUS can be specified directly.



Note!

The block algorithm is not run in the MAN mode (manual). This, in turn, means that limit values are not calculated or displayed.

The output value TOTAL is compared with warning and alarm limits (e.g. HI_LIM, LO_LO_LIM, etc.) that can be entered by means of various parameters. If one of these limit values is violated, a limit value process alarm (e.g. HI_ALM, LO_LO_ALM, etc.) is triggered.

The major functions and parameters of the Totalizer function block are listed below; you will find an overview of all the available parameters starting on Page 87.

6.2 Selecting the operating mode

The operating mode is set by means of the BLOCK_MODE parameter group (see Page 92). The Totalizer function block supports the following operating modes:

- AUTO (automatic mode)
- MAN (manual mode)
- O/S (out of service)

6.3 UNIT TOT, the unit of the totaled measured value

Unit change has a direct effect on the measured value. There is no scaling similar to that in the Analog Input function block. By the same token, the manufacturer-specific SET UNIT TO BUS function is not necessary.

6.4 Status of the TOTAL output value

The status of the TOTAL parameter group communicates to the subsequent function blocks the status of the Totalizer function block and the validity of the output value TOTAL. The following status values can be displayed:

- GOOD_NON_CASCADE
The output value TOTAL is valid and can be used for further processing.
- Uncertain
The output value OUT can only be used for further processing to a limited extent.
- BAD
The output value TOTAL is invalid. Occurs when the Totalizer function block is switched to O/S (Out of Service) or in the event of serious errors (see the sections dealing with status code and system/process error messages in the Operating Instructions *promag 50*, BA 055D/06/en/).

6.5 Error response (FAIL_TOT)

If an input value is statused BAD, the Totalizer function block uses the response defined in the FAIL_TOT parameter. The FAIL_TOT parameter (see Page 88) offers the following options:

- RUN
The totalizer continues to total despite the BAD input value.
- HOLD
The totalizer stops; BAD input values are not totaled.
- MEMORY
The totalizer continues to total with the last valid input value (not statused BAD).

RUN is the default for the FAIL_TOT parameter.

6.6 Selecting the MODE TOT direction for totaling

Use the MODE_TOT parameter (see Page 89) to define the direction in which the totalizer totals. The options are totaling only positive values, only negative values, or all values (positive and negative), or stop the totalizer. The totaled integral is formed in the Totalizer function block. In order to compute this integral the totalizer needs a time reference that is called up equidistantly in time.

The settings that are possible for the MODE_TOT parameter are as follows:

- BALANCED → positive and negative measured values are totaled
- POS_ONLY → only positive values are totaled
- NEG_ONLY → only negative values are totaled
- HOLD → totalizer is stopped

BALANCED is the default for the MODE_TOT parameter.

You will find information on integration into a process-control system in the sections dealing with system integration and configuration examples in Operating Instructions *promag 50*, BA 055D/06/en/.

6.7 Setting of the totalizer: SET TOT

Use the SET_TOT parameter (see Page 89) to start totaling (TOTALIZE), reset the totalizer to 0 (RESET) or set it to a preset value (PRESET).

The settings that are possible for the SET_TOT parameter are as follows:

- TOTALIZE → start the totalizer, total the input value
- RESET → reset the totalizer to 0.
- PRESET → set the totalizer to the value defined in the PRESET_TOT parameter.



Note!

Note that selecting RESET or PRESET resets the totalizer to 0 or, respectively, sets it to the preset value, but does not stop the totalizer. This means that it immediately recommences totaling from the new setting. If you want to stop the totalizer you must select HOLD in the MODE_TOT parameter.

TOTALIZER is the default for the SET_TOT parameter.

You will find information on integration into a process-control system in the sections dealing with system integration and configuration examples in Operating Instructions *promag 50*, BA 055D/06/en/.

6.8 Limit values

You can set two warning limits and two alarm limits for monitoring your process. The status of the measured value and the parameters of the limit-value alarms are indicative of the measured value's relative position. You also have the option of defining an alarm hysteresis in order to avoid frequent changes of the limit-value flags and frequent enabling/disabling of alarms (see Page 90).

The limit values are based on the output value TOTAL. If the output value TOTAL exceeds or does not reach the defined limit values, an alarm is sent to the process-control system via the limit value process alarms.

The following limit values can be defined:

- HI_HI_LIM (see Page 91) – HI_LIM (see Page 91)
- LO_LO_LIM (see Page 92) – LO_LIM (see Page 91)

6.9 Alarm detection and processing

The following process alarms are generated by the Totalizer function block:

• Limit value process alarms

The status of the limit value process alarms is communicated to the process-control system by means of the following parameters:

- HI_HI_ALM (see Page 91) – HI_ALM (see Page 91)
- LO_LO_ALM (see Page 92) – LO_ALM (see Page 91)

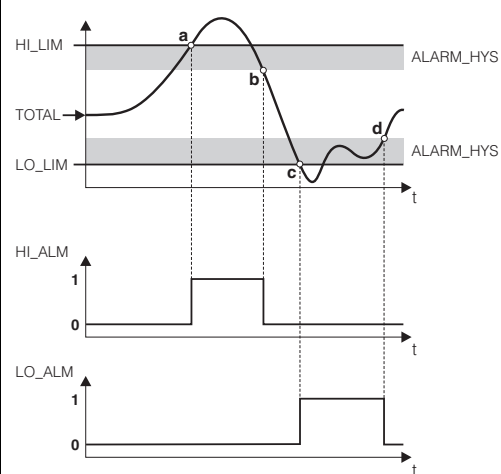
6.10 Parameters of the Totalizer function block

The following table shows all the available parameters of the Totalizer function block.

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
TOTAL (V0...)					
TOTAL_VALUE (V0H0)	TOTAL (Value)	Displays the output value (TOTAL) with alarm weighting.  Note! If MAN (manual) is selected for the operating mode in the MODE_BLK parameter group, the output value TOTAL can be specified manually here.	x	x	M
TOTAL_STATUS (V0H1)	TOTAL (Status)	Displays the current output status (TOTAL).  Note! If MAN (manual) is selected for the operating mode in the MODE_BLK parameter group, the status of the TOTAL output value can be specified manually here.	x	x	M
TOTAL_STATUS (V0H2)	TOTAL (Status bit 0-1)	Displays the quality of the output status. Display: GOOD UNCERTAIN BAD	x		M
TOTAL_SUB_STATUS (V0H3)	TOTAL (Status bit 2-5)	Displays the substatus in plain text.	x		M

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
TOTAL_LIMIT (V0H4)	TOTAL (Limits bit 6-7)	Displays the limit overshoot in plain text. Display: O.K. → no limit overshoot HIGH LIMIT → HI LIMIT or/and HI HI LIMIT overshoot LO LIMIT → LO LIMIT or/and LO LO LIMIT under-shot	X		M
FAILSAFE_MODE (V0H6)	FAIL_TOT	Use this parameter to define error response in the event of a device error or bad measured value. The ACTUAL MODE (the block's current operating mode) remains in AUTO (automatic). Options: RUN The totalizer continues to total despite the BAD input value. HOLD The totalizer stops; BAD input values are not totaled. MEMORY The totalizer continues to total with the last valid input value (not statused BAD). Factory setting: RUN			

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
CONFIGURATION (V1...)					
TOTAL_UNIT (V1H0)	UNIT_TOT	Select the unit for the measured variable. Options: Metric → cm³; dm³; m³; ml; l; hl; Ml US → cc; af; (cft) ft³; (flo) oz f; gal; Mgal; bbl (normal fluids); bbl (beer); bbl (petrochemicals); bbl (filling tanks) Imperial → gal; Mgal; bbl (beer); bbl (petrochemicals) Factory setting (volume): m³	X	X	M
SET_TOTALIZER (V1H1)	SET_TOT	Use this parameter to assign a condition to the totalizer. This function is level-triggered. Options: TOTALIZE → total the measured variable RESET → reset the totalizer to zero. PRESET → set the totalizer to the value defined in the PRESET_TOT parameter. Factory setting: TOTALIZE	X	X	M
PRESET_TOTALIZER (V1H2)	PRESET_TOT	Use this parameter to define a (start-) value to the totalizer. The totalizer does not accept this value unless the "PRESET" option was selected beforehand for the SET_TOT parameter. Factory setting: 0	X	X	M
TOTALIZER_MODE (V1H3)	MODE_TOT	Use this parameter to define how the totalizer totals the flow components. Options: BALANCED → positive and negative flow components. The positive and negative flow components are balanced. In other words, net flow in the flow direction is registered. POS_ONLY → positive flow components only. NEG_ONLY → negative flow components only. HOLD → the totalizer stops. No further flow components are totaled. Factory setting: BALANCED	X	X	M

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
ALARM_LIMITS (V2...)					
ALARM_HYSTERESIS (V2H0)	ALARM_HYS	For entry of the hysteresis value for the upper and lower warning or alarm limit values. The alarm conditions remain active so long as the measured value is within the hysteresis. The hysteresis value affects the following warning and alarm limit values of the totalizer: • HI_HI_ALM (Upper limit value alarm) • HI_ALM (Upper limit value warning) • LO_LO_ALM (Lower limit value alarm) • LO_ALM (Lower limit value warning) User input: 0...50% Factory setting: 0.5% Example: The top diagram shows the limit values defined for the warnings LO_LIM and HI_LIM with their respective hystereses (gray background) and the signal curve of the output value TOTAL. The bottom two diagrams show the behaviour of the associated alarms HI_ALM and LO_ALM in relation to the changing signal curve (0 = no alarm, 1 = alarm output). a = TOTAL exceeds the limit value HI_LIM, HI_ALM (VALUE) is activated. b = TOTAL is below the hysteresis value of HI_LIM, HI_ALM (VALUE) is deactivated. c = TOTAL is below the limit value LO_LIM, LO_ALM (VALUE) is activated. d = TOTAL exceeds the hysteresis value of LO_LIM, LO_ALM (VALUE) is deactivated  F06-50PBxxx-05-xx-xx-de-007	x	x	M

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
HI_HI_ALARM (V3...)					
HI_HI_LIM (V3H0)	HI_HI_LIM	Entry of the alarm limit value for the upper alarm (HI_HI_ALM). If the output value TOTAL exceeds this limit value, the alarm status parameter HI_HI_ALM is output. User input: Range and unit of TOTAL Factory setting: 3402823466 x 10 ³⁸	x	x	M
VALUE (V3H1)	HI_HI_ALM (VALUE)	Alarm-status parameter for the upper alarm limit. Content includes the value that violated the limit.	x		O
ALARM_STATE (V3H2)	HI_HI_ALM (ALARM_STATE)	Use this parameter to view the current status of the HI_HI_ALARM.	x		O
SWITCH-ON_POINT (V3H3)	HI_HI_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	x		O
SWITCH-OFF_POINT (V3H4)	HI_HI_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	x		O
HI_ALARM (V4...)					
HI_LIM (V4H0)	HI_LIM	Entry of the alarm limit value for the upper warning (HI_ALM). If the output value TOTAL exceeds this limit value, the alarm status parameter HI_ALM is output. User input: Range and unit of TOTAL Factory setting: 3402823466 x 10 ³⁸	x	x	M
VALUE (V4H1)	HI_ALM (VALUE)	Alarm-status parameter for the upper warning limit. Content includes the value that violated the limit.	x		O
ALARM_STATE (V4H2)	HI_ALM (ALARM_STATE)	Use this parameter to view the current status of the HI_ALARM.	x		O
SWITCH-ON_POINT (V4H3)	HI_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	x		O
SWITCH-OFF_POINT (V4H4)	HI_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	x		O
LO_ALARM (V5...)					
LO_LIM (V5H0)	LO_LIM	Entry of the alarm limit value for the lower warning (LO_ALM). If the output value TOTAL is below this limit value then the alarm status parameter LO_ALM is output. User input: Range and unit of TOTAL Factory setting: 3402823466 x 10 ³⁸	x	x	M
VALUE (V5H1)	LO_ALM (VALUE)	Alarm-status parameter for the lower warning limit. Content includes the value that violated the limit.	x		O

Totalizer function block						
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P	
ALARM_STATE (V5H2)	LO_ALM (ALARM_STATE)	Use this parameter to view the current status of the LO_ALARM.	x			O
SWITCH-ON_POINT (V5H3)	LO_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	x			O
SWITCH-OFF_POINT (V5H4)	LO_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	x			O
LO_LO_ALARM (V6...)						
LO_LO_LIM (V6H0)	LO_LO_LIM	Entry of the alarm limit value for the lower alarm (LO_LO_ALM). If the output value TOTAL is below this limit value then the alarm status parameter LO_LO_ALM is output. User input: Range and unit of TOTAL Factory setting: 3402823466 x 10 ³⁸	x	x		M
VALUE (V6H1)	LO_LO_ALM (VALUE)	Alarm-status parameter for the lower alarm limit. Content includes the value that violated the limit.	x			O
ALARM_STATE (V6H2)	LO_LO_ALM (ALARM_STATE)	Use this parameter to view the current status of the LO_LO_ALARM.	x			O
SWITCH-ON_POINT (V6H3)	LO_LO_ALM (SWITCH-ON POINT)	Use this parameter to view the switch-on point as a function of hysteresis.	x			O
SWITCH-OFF_POINT (V6H4)	LO_LO_ALM (SWITCH-OFF POINT)	Use this parameter to view the switch-off point as a function of hysteresis.	x			O
BLOCK_MODE (V8...)	General information on the MODE_BLK parameter group: There are three elements in this parameter group: - the current operating mode of the block (Actual_Mode) - the modes supported by the block (Permitted_Mode) - the normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the out-of-service mode (O/S). A function block generally offers a choice of operating modes, whereas the other block types support only the AUTO mode, for example.					
TARGET_MODE (V8H0)	TARGET_MODE	Select the operating mode. Options: AUTO MAN O/S Factory setting: AUTO	x	x		M
ACTUAL (V8H1)	MODE_BLK (ACTUAL)	Displays the current operating mode. Display: AUTO	x			M
NORMAL (V8H2)	MODE_BLK (NORMAL)	Displays the operating mode for normal operation. Display: AUTO	x			M

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
PERMITTED (V8H3)	MODE_BLK (PERMITTED)	Displays the permissible operating modes. Display: AUTO	X		M
CANNEL (V8H5)	CANNEL	Use this parameter for assignment between the logical hardware channel of the Transducer block and the input of the Totalizer block. The Transducer block of the Promag 50 provides one process variable for the input channel of the Totalizer function block. Options: OFF VOLUME FLOW	X	X	M
UNIT_MODE (V8H7)	—	Use this parameter to select the form in which you want the units displayed. - In the list mode the units are displayed with the conventional abbreviations, for example: L/s. - In the number mode the units are displayed in the numerical code defined in the 3.0 profiles, for example: 1034 (L/s).	X	X	O
ALARM_CONFIG (V9...)	General information on the ALARM_CONFIG parameter group: The block supported is the Active Block Alarm, which flags a change in a parameter with static values (Static attribute) for 10 seconds and indicates that an warning limit or an alarm limit has been violated in an Analog Input function block.				
CURRENT (V9H0)	ALARM_SUMMARY (CURRENT)	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1)	ALARM_SUMMARY (DISABLE)	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M
UNACKNOWLEDGED (V9H2)	ALARM_SUMMARY (UNACKNOWLEDGED)	 Note! This parameter is not available in this profile version.			
UNREPORTED (V9H3)	ALARM_SUMMARY (UNREPORTED)	 Note! This parameter is not available in this profile version.			
ST_REVISION (V9H5)	ST_REV	A block has static parameters (Static attribute) that are not changed by the process. Static parameters with values that change during optimisation or configuration increment the ST_REV parameter by 1. This supports parameter-revision management. The Static Revision Counter can show a higher value if several parameters change within a very short period of time, for example when parameters are uploaded to the device from Commuwin II. This counter is never reset, nor does it return to a default setting even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X		M

Totalizer function block					
Matrix text (Commuwin II)	Parameter (SLOT/INDEX)	Description	R	W	P
BLOCK_PARAMETER (VA...)					
TAG (VAH0)	TAG_DESC	Entry of a user-specific text of max. 32 characters for unique identification and assignment of the block. Factory setting: "-----" without text	X	X	M
STRATEGY (VAH1)	STRATEGY	Parameter for grouping and thus faster evaluation of blocks. Grouping is carried out by entering the same numerical value in the parameter STRATEGY for each individual block. Factory setting: 0	X	X	M
ALERT_KEY (VAH2)	ALERT_KEY	Entry of the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. User input: 1...255 Factory setting: 0	X	X	M
PROFILE_VERSION (VAH3)	—	Displays the profile version implemented in the device. Display: 30	X		O
BATCH (VAH4-7)	Batch is a structured parameter consisting of four elements. This parameter is used in batch applications compliant with IEC 61512 Part 1 (ISA S88). Only function blocks include this parameter. There is no algorithm linked to this parameter within a function block. The Batch parameter is necessary in a distributed process-control system as a means of flagging the channels that are used. It can also be used to view errors that have occurred in the current batch process.				
BATCH_ID (VAH4)	BATCH (ID)	ID of a batch application as a means of assigning device messages (alarms, errors).	X	X	M
BATCH_RUP (VAH5)	BATCH (RUP)	This parameter can contain the code for a recipe needed for the batch application, or the unit, such as reactors.	X	X	M
BATCH_PHASE (VAH6)	BATCH (PHASE)	Use this parameter to write or show the current recipe phase.	X	X	M
BATCH_OPERATION (VAH7)	BATCH (OPERATION)	Use this parameter to write or show the current recipe.	X	X	M

7 Slot / Index lists

7.1 General explanatory remarks

Abbreviations used in the Slot / Index lists:

- E+H Matrix → the number of the page on which you will find the explanation of the parameter.
- Object Type:
 - Record → contains data structures (DS)
 - Simple → contains only single data types (e.g. float, integer, etc.)
- Parameter:
 - M → mandatory parameter
 - O → optional parameter
- Data Types:
 - Boolean → true = 0xFF, false = 0x00
 - DS → data structure, contains data types such as Unsigned8, OctetString, etc.
 - Float → IEEE 754 format
 - Integer → 8 (range of values -128...127), 16 (-32768...32767), 32 ($-2^{31}...2^{31}$)
 - Octet String → binary coded
 - Unsigned → 8 (range of values 0...255), 16 (0...65535), 32 (0...4294967295)
 - Visible String → ISO 646, ISO 2375
- Storage Class:
 - Cst → constant parameter
 - D → dynamic parameter
 - N → non-volatile parameter
 - S → static parameter

7.2 Physical Block Slot 0

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X		Record	M	DS-32	20	Cst
ST_REV	Page 42	17	X		Simple	M	Unsigned16	2	N
TAG_DESC	Page 42	18	X	X	Simple	M	Octet String	32	W
STRATEGY	Page 42	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	Page 42	20	X	X	Simple	M	Unsigned8	1	W
TARGET_MODE	Page 41	21	X	X	Simple	M	Unsigned8	1	W
MODE_BLK	Page 41	22	X		Record	M	DS-37	3	D
ALARM_SUM	Page 42	23	X		Record	M	DS-42	8	D
SOFTWARE_REVISION	Page 38	24	X		Simple	M	Octet String	16	Cst
HARDWARE_REVISION	Page 38	25	X		Simple	M	Octet String	16	Cst
DEVICE_MAN_ID	Page 40	26	X		Simple	M	Unsigned16	2	Cst
DEVICE_ID	Page 37	27	X		Simple	M	Octet String	16	Cst
DEVICE_SER_NUM	Page 37	28	X		Simple	M	Octet String	16	Cst
DIAGNOSIS	Page 41	29	X		Simple	M	Octet String	4	D
DIAGNOSIS_EXT	Page 41	30	X		Simple	O	Octet String	6	D

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Physical Block Slot 0 (continued)									
DIAGNOSIS_MASK	Page 40	31	X		Simple	M	Octet String	4	Cst
DIAGNOSIS_MASK_EXTENS	Page 40	32	X		Simple	O	Octet String	6	Cst
DEVICE_CERTIFICATION	Page 38	33	X		Simple	O	Octet String	32	Cst
WRITE_LOCKING	Page 39	34	X	X	Simple	O	Unsigned16	2	N
FACTORY_RESET	Page 38	35	X	X	Simple	O	Unsigned16	2	W
DESCRIPTOR	Page 38	36	X	X	Simple	O	Octet String	32	W
DEVICE_MESSAGE	Page 38	37	X	X	Simple	O	Octet String	32	W
DEVICE_INSTAL_DATE	Page 38	38	X	X	Simple	O	Octet String	16	W
not used	–	39	–	–	–	–	–	–	–
IDENT_NUMBER_SELECTOR	Page 40	40	X	X	Simple	O	Unsigned8	1	W
HW_WRITE_PROTECTION	Page 39	41	X		Simple	O	Unsigned8	1	D
not used	–	42 - 48	–	–	–	–	–	–	–
ACTUAL_ERROR_CODE	–	49	X		Simple	O	Unsigned16	2	D
not used	–	50	–	–	–	–	–	–	–
UPDOWN_FEAT_SUPP	–	51	X		Simple	M	Octet String	1	Const
UPDOWN_CONT_PARA	–	52	X	X	Simple	O	Unsigned8	1	D
UPDOWN_PARA	–	53	X	X	Record	O	UpDowData	20	D
DEV_BUS_ADDR	–	54	X		Simple	O	Unsigned8	1	D
not used	–	55	–	–	–	–	–	–	–
SET_UNIT_TO_BUS	–	56	X	X	Simple	O	Unsigned8	1	N
LOCAL_DISPLAY_INPUT	–	57	X		Record	O	DS-33	5	D
VIEW_PHYSICAL BLOCK	–	58	X	X	Simple	M	Unsigned16, DS-37, DS-42, Octet String[4]	17	D
MEASID	–	59	X		Simple	O	Unsigned8	1	D

7.3 Device Management Slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Directory_Header/ Composite_Directory_Entries	–	0	X		Record	M	Unsigned16	12	Cst
Composite_Directory_Entry/ Composite_Directory_Entries	–	1	X		Record	M	Unsigned16	28	Cst
not used	–	2 -15	–	–	–	–	–	–	–

7.4 AI 1 Volume Flow Block Slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X		Record	M	DS-32	20	Cst
ST_REV	Page 82	17	X		Simple	M	Unsigned16	2	N
TAG_DESC	Page 82	18	X	X	Simple	M	Octet String	32	W
STRATEGY	Page 82	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	Page 82	20	X	X	Simple	M	Unsigned8	1	W
TARGET_MODE	Page 81	21	X	X	Simple	M	Unsigned8	1	W
MODE_BLK	Page 81	22	X		Record	M	DS-37	3	D
ALARM_SUM	Page 82	23	X		Record	M	DS-42	8	D
BATCH	Page 83	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	Page 74	26	X		Record	M	DS-33	5	D
PV_SCALE	Page 75	27	X	X	Array	M	Float	8	W
OUT_SCALE	Page 76	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	Page 75	29	X	X	Simple	M	Unsigned8	1	W
CHANNEL	Page 81	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	Page 77	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	Page 75	33	X	X	Simple	O	Unsigned8	1	W
FSAFE_VALUE	Page 75	34	X	X	Simple	O	Float	4	W
ALARM_HYS	Page 78	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	Page 79	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	Page 79	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	Page 79	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	Page 80	43	X	X	Simple	M	Float	4	W
not used	–	44 - 45	–	–	–	–	–	–	–
HI_HI_ALM	Page 79	46	X		Record	O	DS-39	16	D
HI_ALM	Page 79	47	X		Record	O	DS-39	16	D
LO_ALM	Page 79	48	X		Record	O	DS-39	16	D
LO_LO_ALM	Page 80	49	X		Record	O	DS-39	16	D
SIMULATE	Page 80	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	Page 76	51	X	X	Simple	O	Octet String	16	W
not used	–	52 - 60	–	–	–	–	–	–	–
AI1_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI1	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33,	18	D
not used	–	63 - 69	–	–	–	–	–	–	–

7.5 Transducer Block Slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
BLOCK_OBJECT	–	70	X		Record	M	DS-32	20	Cst
ST_REV	Page 68	71	X		Simple	M	Unsigned16	2	N
TAG_DESC	Page 68	72	X	X	Simple	M	OctetString	32	W
STRATEGY	Page 68	73	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	Page 69	74	X	X	Simple	M	Unsigned8	1	W
TARGET_MODE	Page 67	75	X	X	Simple	M	Unsigned8	1	W
MODE_BLK	Page 67	76	X		Record	M	DS-37	3	D
ALARM_SUM	Page 68	77	X		Record	M	DS-42	8	D
CALIBR_FACTOR	Page 67	78	X	X	Simple	M	float	4	W
LOW_FLOW_CUTOFF	Page 66	79	X	X	Simple	M	float	4	W
MEASUREMENT_MODE	Page 66	80	X	X	Simple	M	Unsigned8	1	W
FLOW_DIRECTION	Page 66	81	X	X	Simple	M	Unsigned8	1	W
ZERO_POINT	Page 66	82	X	X	Simple	M	float	4	W
ZERO_POINT_ADJUST	Page 66	83	X	X	Simple	M	Unsigned8	1	N
ZERO_POINT_UNIT	Page 66	84	X	X	Simple	M	Unsigned16	2	W
NOMINAL_SIZE	Page 67	85	X	X	Simple	M	float	4	W
NOMINAL_SIZE_UNITS	Page 67	86	X	X	Simple	M	Unsigned16	2	W
VOLUME_FLOW	Page 65	87	X		Record	M	DS-33	5	D
VOLUME_FLOW_UNITS	Page 65	88	X	X	Simple	M	Unsigned16	2	W
VOLUME_FLOW_LO_LIMIT	Page 65	89	X	X	Simple	M	float	4	W
VOLUME_FLOW_HI_LIMIT	Page 65	90	X	X	Simple	M	float	4	W
not used	–	91 - 110	–	–	–	–	–	–	–
SAMPLING_FREQ	Page 65	111	X		Record	M	DS-33	5	D
SAMPLING_FREQ_UNITS	Page 65	112	X	X	Simple	M	Unsigned16	2	W
not used	–	113 - 122	–	–	–	–	–	–	–
ACCESS_CODE	Page 46	123	X	X	Simple	O	Signed16	2	N
DEFINE_PRIVATE_CODE	Page 46	124	X	X	Simple	O	Signed16	2	W
STATUS_ACCESS	Page 46	125	X		Simple	O	Unsigned8	1	D
SYSTEM_RESET	Page 53	126	X	X	Simple	O	Unsigned8	1	N
INSTALL_DIRECTION_SENSOR	Page 52	127	X	X	Simple	O	Unsigned8	1	W
NOMINAL_DIAMETER	Page 54	128	X	X	Simple	O	Unsigned8	1	W
POSITIVE_ZERO_RETURN	Page 53	129	X	X	Simple	O	Unsigned8	1	N
ASSIGN_LOW_FLOW_CUTOFF	Page 47	130	X	X	Simple	O	Unsigned8	1	W
ON_VALUE_LOW_FLOW_CUTOFF	Page 47	131	X	X	Simple	O	Float	4	W
OFF_VALUE_LOW_FLOW_CUTOFF	Page 47	132	X	X	Simple	O	Float	4	W
EPD_ELECTRODE	Page 49	133	X	X	Simple	O	Unsigned8	1	W
EMPTY_PIPE_DETECTION	Page 48	134	X	X	Simple	O	Unsigned8	1	W
EMPTY_PIPE_ADJUST_VALUE	–	135	X	X	Simple	O	Float	4	W
FULL_PIPE_ADJUST_VALUE	–	136	X	X	Simple	O	Float	4	W
EPD_RESPONSE_TIME	Page 49	137	X	X	Simple	O	Float	4	W
EPD_PERIOD	–	138	X	X	Simple	O	Float	4	W

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Transducer Block Slot 1 (continued)									
EPD_ADJUSTMENT	Page 49	139	X	X	Simple	O	Unsigned8	1	W
ECC	–	140	X	X	Simple	O	Unsigned8	1	W
ECC_DURATION	–	141	X	X	Simple	O	Float	4	W
ECC_RECOVERY_TIME	–	142	X	X	Simple	O	Float	4	W
ECC_CLEANING_CYCLE	–	143	X	X	Simple	O	Float	4	W
ECC_POLARITY	–	144	X	X	Simple	O	Unsigned8	1	W
SHOT_TIME	–	145	X	X	Simple	O	Float	4	W
SYSTEM_DAMPING	Page 53	146	X	X	Simple	O	Float	4	W
INTEGRATION_TIME	Page 53	147	X	X	Simple	O	Float	4	W
MEASURING_PERIOD	Page 54	148	X	X	Simple	O	Float	4	W
K_FACTOR_POSITIVE	Page 54	149	X	X	Simple	O	Float	4	W
K_FACTOR_NEGATIVE	Page 54	150	X	X	Simple	O	Float	4	W
ZERO_POINT	Page 54	151	X	X	Simple	O	Float	4	W
ALARM_DELAY	Page 60	152	X	X	Simple	O	Float	4	W
SIMULATION_MEASURAND	Page 62	153	X	X	Simple	O	Unsigned8	1	N
VALUE_SIMULATION_MEASURAND	Page 62	154	X	X	Simple	O	Float	4	N
SERIAL_NUM	Page 63	155	X	X	Simple	O	OctetString	16	W
SENSOR_TYPE	Page 63	156	X	X	Simple	O	OctetString	16	W
HW_REV_SENSOR	Page 63	157	X	X	Simple	O	OctetString	16	W
HW_IDENT_SENSOR	–	158	X	X	Simple	O	OctetString	16	W
PROD_NUM_SENSOR	–	159	X	X	Simple	O	OctetString	16	W
SW_REV_S_DAT	Page 63	160	X	X	Simple	O	OctetString	16	W
HW_REV_AMP	Page 63	161	X	X	Simple	O	OctetString	16	W
HW_IDENT_AMP	–	162	X	X	Simple	O	OctetString	16	W
SW_REV_AMP	Page 63	163	X	X	Simple	O	OctetString	16	W
SW_IDENT_AMP	–	164	X	X	Simple	O	OctetString	16	W
PROD_NUM_AMP	–	165	X	X	Simple	O	OctetString	16	W
IO_TYPE	Page 63	166	X		Simple	O	Unsigned8	1	N
HW_REV_IO	Page 63	167	X	X	Simple	O	OctetString	16	W
HW_IDENT_IO	–	168	X	X	Simple	O	OctetString	16	W
SW_REV_IO	Page 63	169	X	X	Simple	O	OctetString	16	W
SW_IDENT_IO	–	170	X	X	Simple	O	OctetString	16	W
PROD_NUM_IO	–	171	X	X	Simple	O	OctetString	16	W
SYS_UNIT_VOL	–	172	X	X	Simple	O	Unsigned8	1	W
HMI_LANGUAGE	Page 57	173	X	X	Simple	O	Unsigned8	1	W
HMI_DAMPING	Page 57	174	X	X	Simple	O	Float	4	W
HMI_LCD_CONTRAST	Page 57	175	X	X	Simple	O	Float	4	W
HMI_ASSIGN_LINE	Page 58	176	X	X	Simple	O	Unsigned8	1	W
HMI_100PC_VALUE	Page 58	177	X	X	Simple	O	Float	4	W
HMI_FORMAT	Page 58	178	X	X	Simple	O	Unsigned8	1	W
HMI_ASSIGN_LINE_2	Page 59	179	X	X	Simple	O	Unsigned8	1	W
SIM_FSAFE_MODE	Page 63	180	X	X	Simple	O	Unsigned8	1	W

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Transducer Block Slot 1 (continued)									
BLOCK_SELECTION	Page 51	181	X	X	Simple	O	Unsigned8	1	W
OUT_VALUE	Page 51	182	X		Record	O	DS-33	5	N
ACTUAL_BAURATE	Page 52	183	X		Simple	O	Unsigned8	1	N
CHECK_CONFIG	Page 52	184	X		Simple	O	Signed16	2	N
SA_MEASURING_PERIOD	–	185	X		Simple	O	Float	4	N
SA_RISETIME	–	186	X		Simple	O	Float	4	N
PREV_SYS_COND	Page 60	187	X		Simple	O	Unsigned8	1	N
DEVICE_ID	Page 52	188	X		Simple	O	Unsigned8	1	N
not used	–	189 - 206	–	–	–	–	–	–	–
VIEW_TRANSDUCER BLOCK	–	207	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	23	D
not used	–	208 - 210	–	–	–	–	–	–	–

7.6 Totalizer 1 Block Slot 2

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X		Record	M	DS-32	20	Cst
ST_REV	Page 93	17	X		Simple	M	Unsigned16	2	N
TAG_DESC	Page 94	18	X	X	Simple	M	Octet String	32	W
STRATEGY	Page 94	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	Page 94	20	X	X	Simple	M	Unsigned8	1	W
TARGET_MODE	Page 92	21	X	X	Simple	M	Unsigned8	1	W
MODE_BLK	Page 92	22	X		Record	M	DS-37	3	D
ALARM_SUM	Page 93	23	X		Record	M	DS-42	8	D
BATCH	Page 94	24	X	X	Record	M	DS-67	10	W
not used	–	25	–	–	–	–	–	–	–
TOTAL	Page 87	26	X		Record	M	DS-33	5	N
UNIT_TOT	Page 89	27	X	X	Simple	M	Unsigned16	2	W
CHANNEL	Page 93	28	X	X	Simple	M	Unsigned16	2	W
SET_TOT	Page 89	29	X	X	Simple	M	Unsigned8	1	N
MODE_TOT	Page 89	30	X	X	Simple	M	Unsigned8	1	N
FAIL_TOT	Page 88	31	X	X	Simple	M	Unsigned8	1	W
PRESET_TOT	Page 89	32	X	X	Simple	M	Float	4	W
ALARM_HYS	Page 90	33	X	X	Simple	M	Float	4	W
HI_HI_LIM	Page 91	34	X	X	Simple	M	Float	4	W
HI_LIM	Page 91	35	X	X	Simple	M	Float	4	W
LO_LIM	Page 91	36	X	X	Simple	M	Float	4	W
LO_LO_LIM	Page 92	37	X	X	Simple	M	Float	4	W
HI_HI_ALM	Page 91	38	X		Record	O	DS-39	16	D
HI_ALM	Page 91	39	X		Record	O	DS-39	16	D
LO_ALM	Page 91	40	X		Record	O	DS-39	16	D
LO_LO_ALM	Page 92	41	X		Record	O	DS-39	16	D
not used	–	42 51	–	–	–	–	–	–	–
TOT1_TYPE	–	52	X		Simple	O	Unsigned16	2	Cst
OVERFLOW	–	53	X	X	Simple	O	Unsigned16	2	N
VIEW_TOT1	–	54	X		Record	M	Unsigned16, DS-37, DS-42, DS-33	18	D

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