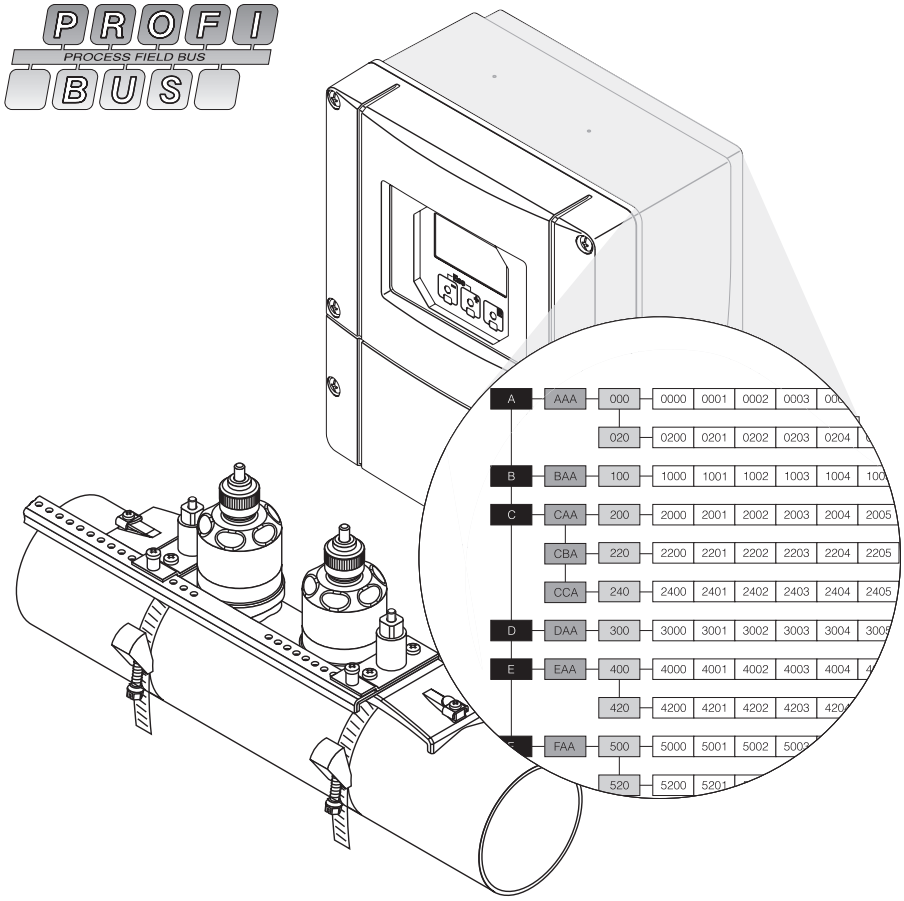
BA 077D/06/en/12.02
50102135

Valid as of software version:
V 1.05.XX (amplifier)
V 2.02.XX (communication)

PROline prosonic flow 93 PROFIBUS-DP/-PA
Ultrasonic Flow Measuring System

Description of Device Functions



Endress+Hauser
The Power of Know How

Operation Prosonic Flow 93 PROFIBUS

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Contents (local operation)

1 Notes on using this manual

There are various ways of locating the description of a function of your choice in the manual:

1.1 Using the table of contents to locate a function description

The designations of all the cells in the function matrix are listed in the table of contents. You can use these unambiguous designations (such as USER INTERFACE, INPUTS, OUTPUTS, etc.) to choose whichever functions are applicable to a particular set of conditions. The page references show you exactly where to find the detailed descriptions of the functions in question.
The table of contents is on Page 5.

1.2 Using the graphic of the function matrix to locate a function description

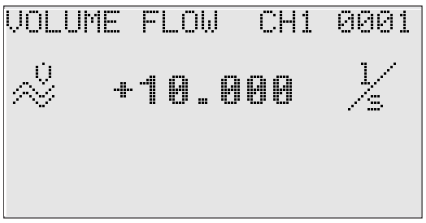
This step-by-step, top-down approach starts with the blocks, the highest level, and works down through the matrix to the description of the function you need:

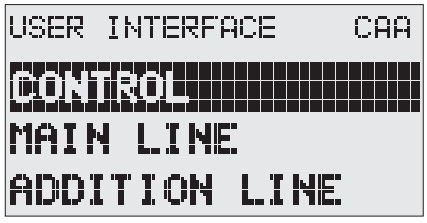
1. All blocks available, and their related groups, are illustrated on Page 10. Select the block (or the group within the block) which you need for your application and use the page reference to locate the information corresponding to the next level.
2. The page in question contains a graphic showing the block with all its subordinate groups, function groups and functions. Select the function which you need for your application and use the page reference to locate the detailed function description.

1.3 Using the index of the function matrix to locate a function description

Each “cell” in the function matrix (blocks, groups, function groups, functions) has a unique identifier in the form of a code consisting of one or three letters or a three- or four-digit number. The code identifying a selected “cell” appears at the top right on the local display.

Example:





F06-93PBxxxx-20-xx-xx-en-000

The function-matrix index lists the codes for all the available “cells” in alphabetic and consecutive order, complete with the page references for the corresponding functions.

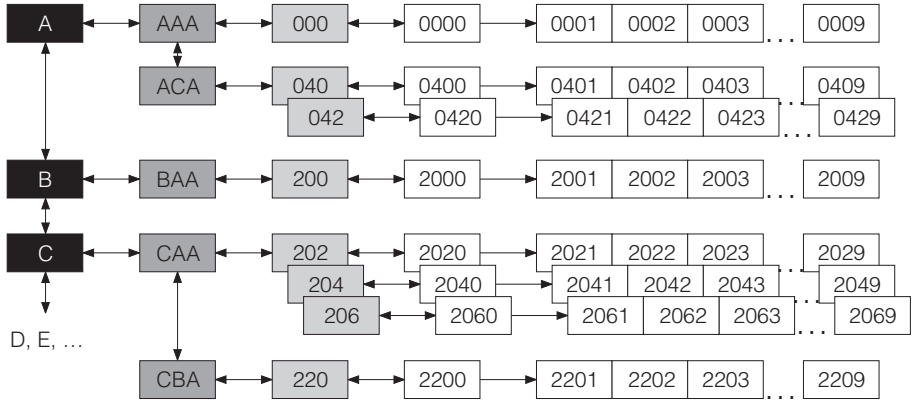
The index to the function matrix is on Page 73.

2 Function matrix

2.1 General layout of the function matrix

The function matrix consists of four levels:

Blocks -> Groups -> Function groups -> Functions



2.1.1 Blocks (A, B, C, etc.)

The blocks are the highest-level grouping of the operation options for the device. The blocks include, for example: MEASURED VARIABLES, QUICK SETUP, USER INTERFACE, BASIC FUNCTIONS, etc.

2.1.2 Groups (AAA, AEA, CAA, etc.)

A block consists of one or more groups. Each group represents a more detailed selection of the operation options in the higher-order block. The groups in the “USER INTERFACE” block, for example, include: CONTROL, MAIN LINE, ADDITIONAL LINE, etc.

2.1.3 Function groups (000, 020, 060, etc.)

A group consists of one or more function groups. Each function group represents a more detailed selection of the operation options in the higher-order group. The function groups in the “CONTROL” group, for example, include: BASIC CONFIGURATION, UNLOCK/LOCK, OPERATION, etc.

2.1.4 Functions (0000, 0001, 0002, etc.)

Each function group consists of one or more functions. The functions are used to operate and parameterise the device. Numerical values can be entered or parameters selected and saved.
The functions in the “BASIC CONFIGURATION” function group, for example, include LANGUAGE, DISPLAY DAMPING, CONTRAST LCD, etc. The procedure for changing the language of the user interface, for example, is as follows:

1. Select the “USER INTERFACE” Block.
2. Select the “CONTROL” group.
3. Select the “BASIC CONFIGURATION” function group
4. Select the “LANGUAGE” function (here you can set the language required).

2.1.5 Codes identifying cells

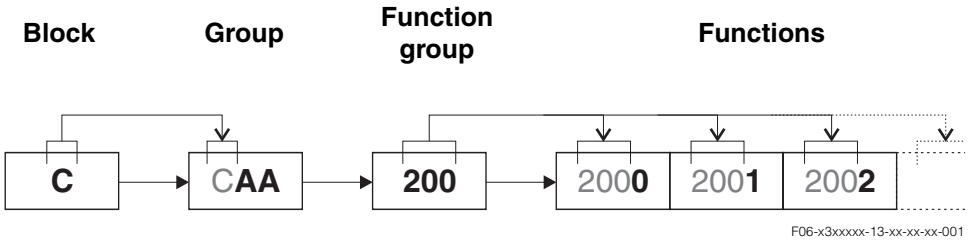
Each cell (block, group, function group and function) in the function matrix has an individual, unique code.

Blocks:
The code is a letter (A, B, C, etc.)

Groups:
The code consists of three letters (AAA, ABA, BAA, etc.).
The first letter matches the block code (i.e. each group in block A has a code starting with an A _ _; the codes of the groups in block B start with a B _ _, etc.). The other two letters are for identifying the group within the respective block.

Function groups:
The code consists of three digits (000, 001, 100, etc.).

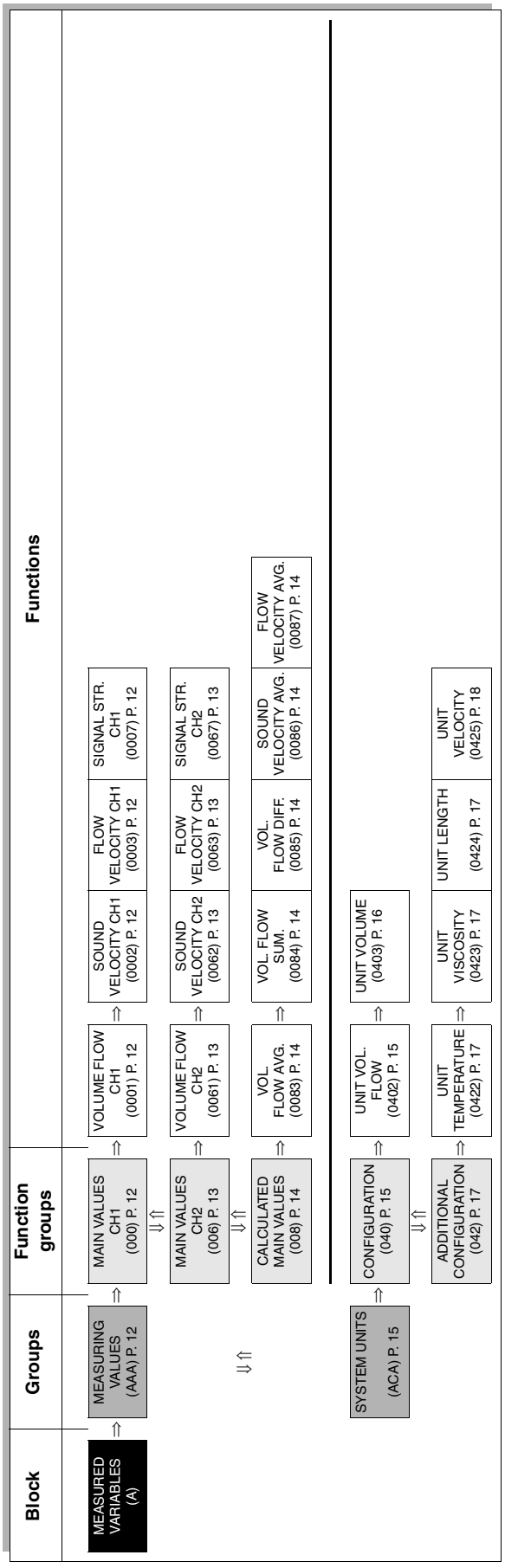
Functions:
The code consists of four digits (0000, 0001, 0201, etc.).
The first three digits are the same as the code for the function group.
The last digit in the code is a counter for the functions in the function group, incrementing from 0 to 9 (e.g. function 0005 is the sixth function in group 000).



2.2 Function matrix Prosonic Flow 93 PROFIBUS

BLOCKS	GROUPS		FUNCTION GROUPS
MEASURED VARIABLES A (see Page 11)	MEASURING VALUES	AAA	→ Page 12
	SYSTEM UNITS	ACA	→ Page 15
QUICK SETUP B (see Page 19)	Commissioning and application setups		→ Page 19
USER INTERFACE C (see Page 23)	CONTROL	CAA	→ Page 24
	MAIN LINE	CCA	→ Page 28
	ADDITIONAL LINE	CEA	→ Page 32
	INFORMATION LINE	CGA	→ Page 36
BASIC FUNCTION G (see Page 40)	PROFIBUS-DP or PROFIBUS-PA	GBA GCA	→ Page 41
	PROC. PARAM. (CH1...2)	GIA, GIB	→ Page 48
	SYST. PARAM. (CH1...CH2)	GLA, GLB	→ Page 59
	SENSOR DATA (CH1...CH2)	GNA, GNB	→ Page 60
SUPERVISION J (see Page 66)	SYSTEM	JAA	→ Page 67
	SYSTEM CH2	JAB	→ Page 67
	VERSION INFO	JCA	→ Page 70

3 Block MEASURED VARIABLES



3.1 Group MEASURING VALUES

3.1.1 Function group MAIN VALUES CH1

MEASURED VARIABLES A ⇒ MEASURING VALUES AAA ⇒ MAIN VALUES CH1 000

Function description MEASURED VARIABLES → MEASURING VALUES → MAIN VALUES CH1	
The measured values of channel 1 currently measured are displayed in this function group. ✎ Note! • The engineering units of all the measured variables 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 CH1 (0001)	The volume flow currently measured appears on the display (channel 1). **Display:** 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)
SOUND VELOCITY CH1 (0002)	The sound velocity currently measured in the liquid appears on the display (channel 1). **Display:** 5-digit fixed-point number, incl. units (e.g. 1400.0 m/s, 5249.3 ft/s)
FLOW VELOCITY CH1 (0003)	The flow velocity currently measured appears on the display (channel 1). **Display:** 5-digit floating-point number, including unit and sign (e.g. 8.0000 m/s, 26.247 ft/s)
SIGNAL STRENGTH CH1 (0007)	The signal strength appears on the display (channel 1). **Display:** 4-digit fixed-point number (e.g. 80.0) ✎ Note! To ensure reliable measurement takes place, Prosonic Flow requires a signal strength of > 30.

3.1.2 Function group MAIN VALUES CH2

MEASURED VARIABLES A ⇒ **MEASURING VALUES AAA** ⇒ **MAIN VALUES CH2 006**

Function description MEASURED VARIABLES → MEASURING VALUES → MAIN VALUES CH2	
The measured values of channel 2 currently measured are displayed in this function group. ✎ Note! • The engineering units of all the measured variables 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 CH2 (0061)	The volume flow currently measured appears on the display (channel 2). **Display:** 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)
SOUND VELOCITY CH2 (0062)	The sound velocity currently measured in the liquid appears on the display (channel 2). **Display:** 5-digit fixed-point number, incl. units (e.g. 1400.0 m/s, 5249.3 ft/s)
FLOW VELOCITY CH2 (0063)	The flow velocity currently measured appears on the display (channel 2). **Display:** 5-digit floating-point number, including unit and sign (e.g. 8.0000 m/s, 26.247 ft/s)
SIGNAL STRENGTH CH2 (0067)	The signal strength appears on the display (channel 2). **Display:** 4-digit fixed-point number (e.g. 80.0) ✎ Note! To ensure reliable measurement takes place, Prosonic Flow requires a signal strength of > 30.

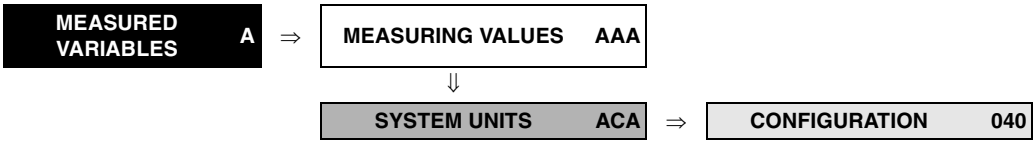
3.1.3 Function group CALCULATED MAIN VALUES

MEASURED VARIABLES A ⇒ **MEASURING VALUES AAA** ⇒ **CALCULATED MAIN VALUES 008**

Function description MEASURED VARIABLES → MEASURING VALUES → BERECHNETE HAUPTWERTE	
The calculated measured values appear on the display. The measured values of both channels are used when calculating the values. ✎ Note! • The engineering units of all the measured variables 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 AVG. (0083)	The average volume flow appears on the display. This is calculated from the measured values: (VOLUME FLOW CH1 + VOLUME FLOW CH2) · 1/2 **Display:** 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)
VOLUME FLOW SUM. (0084)	The total volume flow appears on the display. This is calculated from the measured values: VOLUME FLOW CH1 + VOLUME FLOW CH2. **Display:** 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)
VOLUME FLOW DIFFERENCE (0085)	The difference between the volume flows appears on the display. This is calculated from: VOLUME FLOW CH1 – VOLUME FLOW CH2 **Display:** 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)
SOUND VELOC. AVG. (0086)	The average sound velocity appears on the display. This is calculated from: (SOUND VELOCITY CH1 + SOUND VELOCITY CH2) · 1/2 **Display:** 5-digit fixed-point number, incl. units (e.g. 1400.0 m/s, 5249.3 ft/s)
FLOW VELOCITY AVG. (0087)	The average sound velocity appears on the display. This is calculated from: (FLOW VELOCITY CH1 + FLOW VELOCITY CH2) · 1/2 **Display:** 5-digit floating-point number, including unit and sign (e.g. 8.0000 m/s, 26.247 ft/s)

3.2 Group SYSTEM UNITS

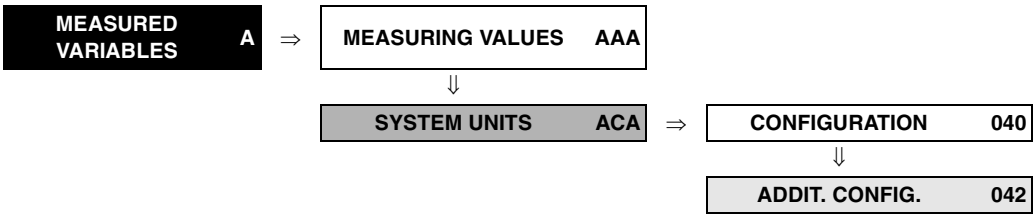
3.2.1 Function group CONFIGURATION



Function description MEASURED VARIABLES → SYSTEM UNITS → CONFIGURATION	
Use this function group to select the units for the measured variables. ✎ Note! If the fluid in the pipe flows backwards, a negative sign prefixes the flow reading on the display.	
UNIT VOLUME FLOW (0402)	Use this function to select the unit for displaying the volume flow. The unit you select here is also valid for: • Output PROFIBUS-DP/-PA • Low flow cut off **Options:** ✎ Note! The following units of time (...) can be selected: s = second, m = minute, h = hour, d = day *Metric:* Cubic centimetre → cm^3/... Cubic decimetre → dm^3/... Cubic metre → m^3/... Millilitre → ml/... Litre → l/... Hectolitre → hl/... Megalitre → Ml/... MEGA *US:* Cubic centimetre → cc/... Acre foot → af/... Cubic foot → ft^3/... Fluid ounce → oz f/... Gallon → US gal/... Million gallon → US Mgal/... Barrel (normal fluids: 31.5 gal/bbl) → US bbl/... NORM. Barrel (beer: 31.0 gal/bbl) → US bbl/... BEER Barrel (petrochemicals: 42.0 gal/bbl) → US bbl/... PETR. Barrel (filling tanks: 55.0 gal/bbl) → US bbl/... TANK *Imperial:* Gallon → imp. gal/... Mega gallon → imp. Mgal/... Barrel (beer: 36.0 gal/bbl) → imp. bbl/... BEER Barrel (petrochemicals: 34.97 gal/bbl) → imp. bbl/... PETR. **Factory setting:** l/s

Function description MEASURED VARIABLES → SYSTEM UNITS → CONFIGURATION	
UNIT VOLUME (0403)	Use this function to select the unit for displaying the volume. **Options:** *Metric:* Cubic centimetre → cm^3 Cubic decimetre → dm^3 Cubic metre → m^3 Millilitre → ml Litre → l Hectolitre → hl Megalitre → Ml MEGA *US:* Cubic centimeter → cc Acre foot → af Cubic foot → ft^3 Fluid ounce → oz f Gallon → US gal Million gallon → US Mgal Barrel (normal fluids: 31.5 gal/bbl) → US bbl NORM.FL. Barrel (beer: 31.0 gal/bbl) → US bbl BEER Barrel (petrochemicals: 42.0 gal/bbl) → US bbl PETROCH. Barrel (filling tanks: 55.0 gal/bbl) → US bbl TANK *Imperial:* Gallon → imp. gal Mega gallon → imp. Mgal Barrel (beer: 36.0 gal/bbl) → imp. bbl BEER Barrel (petrochemicals: 34.97 gal/bbl) → imp. bbl PETROCH. **Factory setting:** l (litre) ✎ Note! • The unit of the totalizers is independent of your choice here. The unit for each totalizer is selected separately for the totalizer in question. • The unit selected in this function only applies to the display on the local display, i.e. it is not used by the measuring system for further processing of measured variables.

3.2.2 Function group ADDITIONAL CONFIGURATION



Function description MEASURED VARIABLES → SYSTEM UNITS → ADDITIONAL CONFIGURATION	
UNIT TEMPERATURE (0422)	Use this function to select the unit for displaying the fluid temperature. ✎ Note! The liquid temperature is entered in the function TEMPERATURE (see Page 56). **Options:** °C (Celsius) K (Kelvin) °F (Fahrenheit) R (Rankine) **Factory setting:** °C
UNIT VISCOSITY (0423)	Use this function to select the unit for fluid viscosity. **Options:** mm^2/s cSt St **Factory setting:** mm^2/s
UNIT LENGTH (0424)	Use this function to select the unit for the measure of length. The unit you select here is valid for: • Nominal diameter • Diameter • Wall thickness • Liner thickness • Path length • Wire length • Sensor distance ... **Options:** MILLIMETER INCH **Factory setting:** MILLIMETER

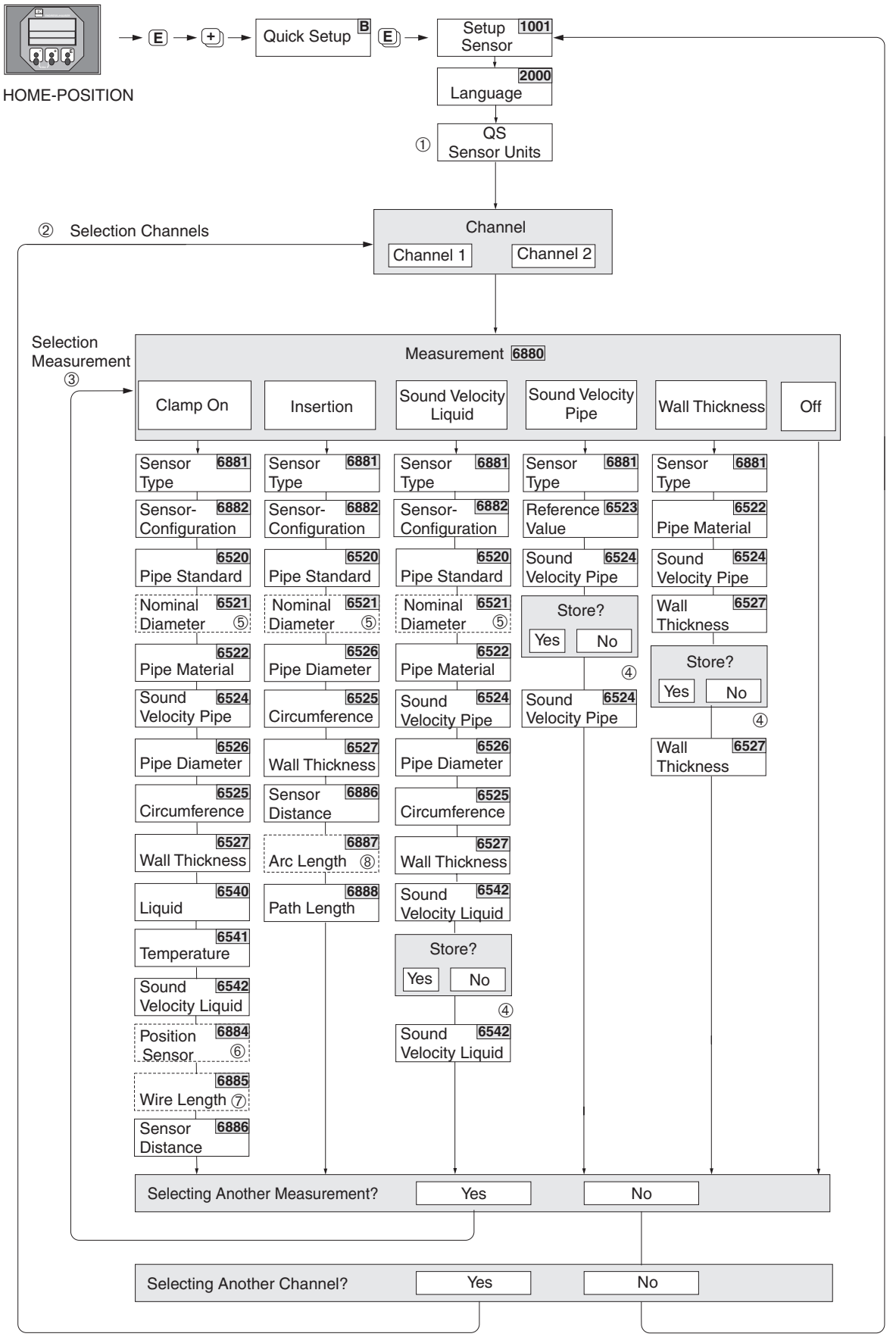
Function description MEASURED VARIABLES → SYSTEM UNITS → ADDITIONAL CONFIGURATION	
UNIT VELOCITY (0425)	Use this function to select the unit for displaying the velocity. The unit you select here is valid for: • Sound velocity • Flow velocity **Options:** m/s ft/s **Factory setting:** m/s

4 Block QUICK SETUP

Block	Group	Function groups	Functions			
QUICK SETUP (B)	⇒	⇒	SETUP SENSOR (1001) P. 19	⇒	QS COMMISSION. (1002) P. 19	T-DAT SAVE/ LOAD (1009) P. 19

Function description QUICK SETUP	
QUICK SETUP SENSOR (1001)	Use this function to start the Quick Setup menu for mounting the ultrasonic sensors. **Options:** YES NO **Factory setting:** NO ✎ Note! You will find a flowchart of the “Sensor installation” Quick Setup menu on Page 20. More detailed information on Quick Setups is provided in the related Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*.
SETUP COMMISSIONING (1002)	Use this function to start the Quick Setup for commissioning. **Options:** YES NO **Factory setting:** NO ✎ Note! You will find a flowchart of the “COMMISSIONING” Quick Setup menu on Page 22. More detailed information on Quick Setups is provided in the related Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*.
T-DAT SAVE/LOAD (1009)	Use this function to save the parameter settings / configuration of the **transmitter** in a transmitter DAT (T-DAT) or to load the parameter settings from the T-DAT into the EEPROM (**manual** security function). Application examples: • After commissioning, the current measuring point parameters can be saved to the T-DAT as a backup. • If the transmitter is replaced for some reason, the data from the T-DAT can be loaded into the new transmitter (EEPROM). **Options:** CANCEL SAVE (from EEPROM to T-DAT) LOAD (from the T-DAT into EEPROM) **Factory setting:** CANCEL ✎ Note! If the power supply fails, the totalizer readings are automatically saved to the EEPROM.

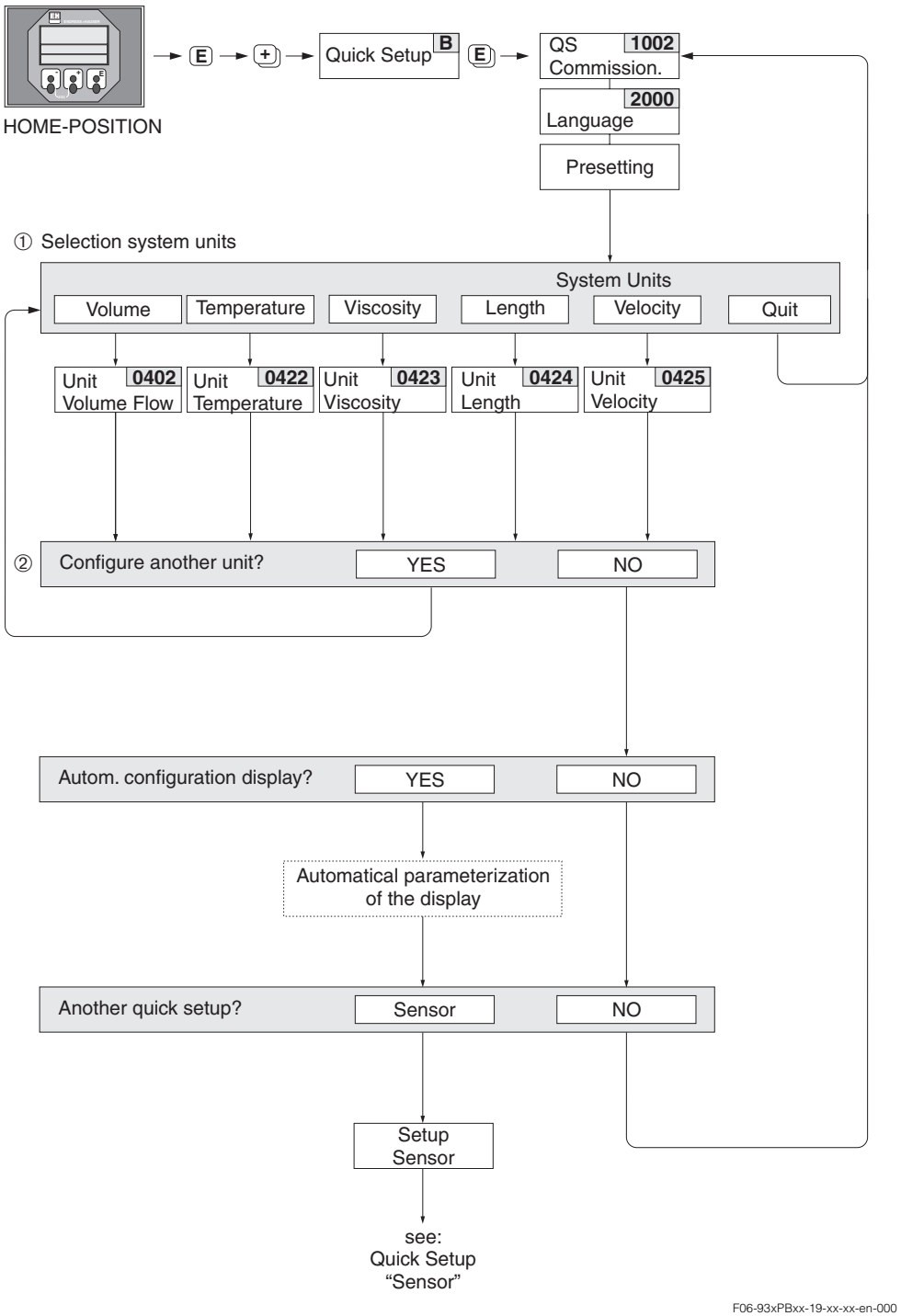
4.1 "Sensor Installation" Quick Setup



✎ Note!

- The display returns to the SETUP SENSOR (1001) cell if you press the ESC key combination during parameter interrogation.
- ① The choice of units only affects the UNIT TEMPERATURE (0422), UNIT LENGTH (0424) and UNIT VELOCITY (0425) functions.
- ② If a channel is selected for which a Quick Setup has already been carried out beforehand, the previous values are overwritten.
- ③ All options are offered for selection in each cycle. Any settings which may already have been made in a cycle are overwritten.
- ④ Option “YES”: The value measured during the Quick Setup is applied to the function in question. Option “NO”: The measurement is rejected and the original value is retained.
- ⑤ The NOMINAL DIAMETER (6521) function only appears if OTHER is *not* selected in the PIPE STANDARD (6520) function.
- ⑥ The POSITION SENSOR (6884) function does not appear unless CLAMP ON is set in the MEASUREMENT function and the number of traverses in the SENSOR CONFIGURATION (6882) function is 2 or 4.
- ⑦ The WIRE LENGTH (6885) function does not appear unless CLAMP ON is set in the MEASUREMENT function and the number of traverses in the SENSOR CONFIGURATION (6882) function is 1 or 3.
- ⑧ The ARC LENGTH (6887) function does not appear unless INSERTION is set in the MEASUREMENT function and DUAL PATH is selected in the SENSOR CONFIGURATION (6882) function.

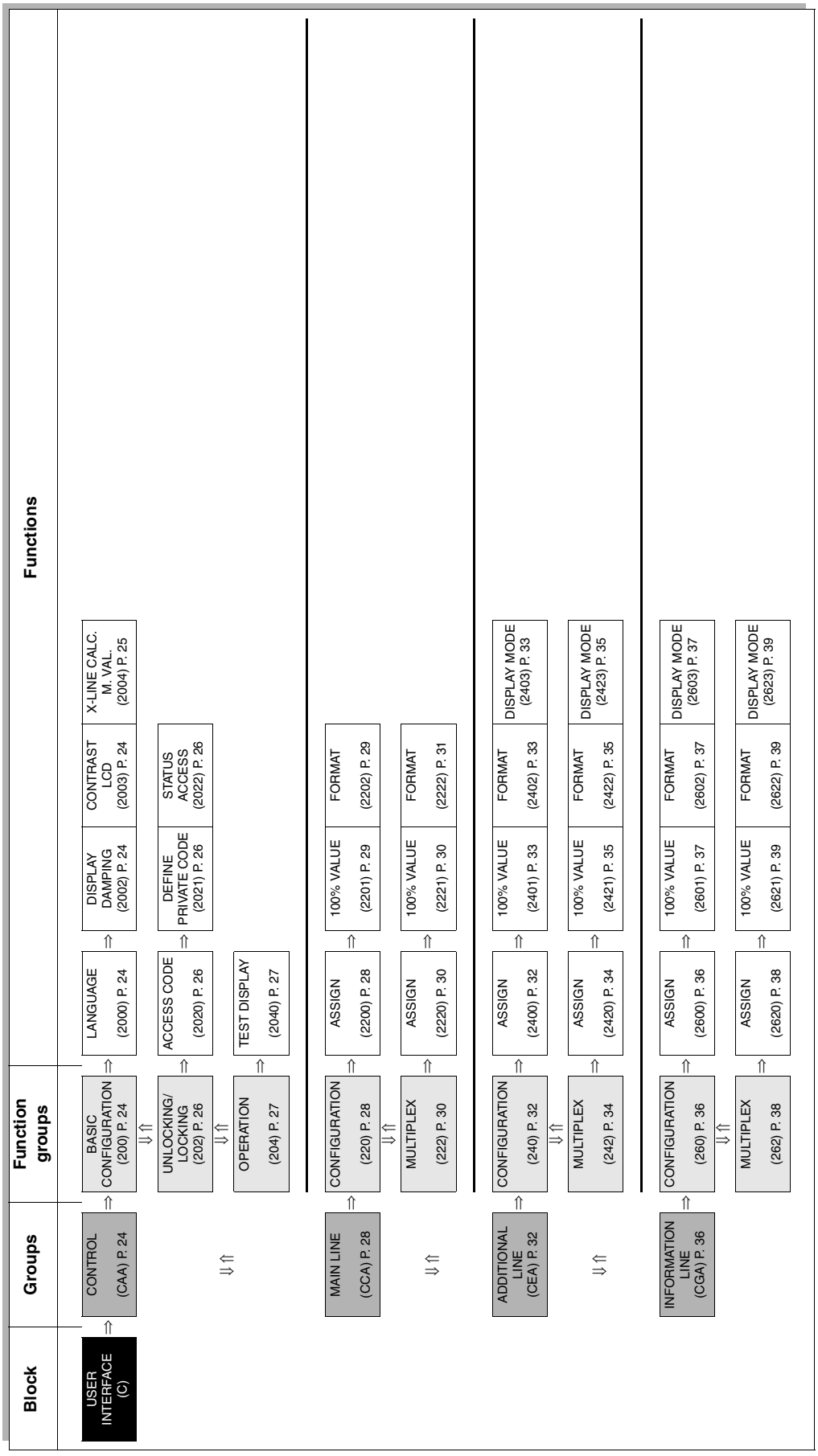
4.2 “Commissioning” Quick Setup



✎ Note!

- The display returns to the SETUP COMMISSIONING (1002) cell if you press the ESC key combination during parameter interrogation.
- ① Only the units not yet configured in the current Quick Setup are offered for selection in each cycle. The unit for volume is derived from the volume flow unit.
- ② The “YES” option remains visible until all the units have been configured. “NO” is the only option displayed when no further units are available.

5 Block USER INTERFACE



5.1 Group CONTROL

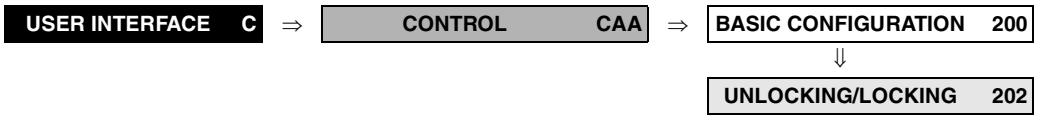
5.1.1 Function group BASIC CONFIGURATION

USER INTERFACE C ⇒ **CONTROL CAA** ⇒ **BASIC CONFIGURATION 200**

Function description USER INTERFACE ➞ CONTROL ➞ BASIC CONFIGURATION	
LANGUAGE (2000)	Use this function to select the language for all texts, parameters and messages shown on the local display. **Options:** ENGLISH – DEUTSCH – FRANCAIS – ESPANOL – ITALIANO – NEDERLANDS – DANSK – NORSK – SVENSKA – SUOMI – BAHASA INDONESIA – JAPANESE (syllabary) **Factory setting:** – ENGLISH: Australia, England, Hong Kong, India, Instruments International, Malaysia, Singapore, South Africa, Thailand, Hungary – DEUTSCH: Germany, Austria, Switzerland – FRANCAIS: France – ESPANOL: Spain – ITALIANO: Italy – NEDERLANDS: The Netherlands – DANSK: Denmark – NORSK: Norway – SVENSKA: Sweden – SUOMI: Finland – BAHASA INDONESIA: Indonesia – JAPANESE: Japan ✎ Note! If you press the ⊞ keys simultaneously during startup, the language defaults to “ENGLISH”.
DISPLAY DAMPING (2002)	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 (2003)	Use this function to optimise display contrast to suit local operating conditions. **User input:** 10...100% **Factory setting:** 50%

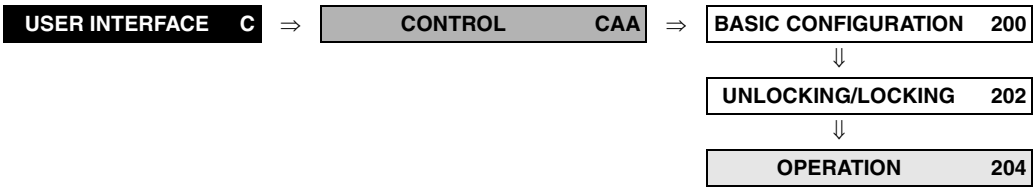
Function description USER INTERFACE → CONTROL → BASIC CONFIGURATION	
X-LINE CALCULATED MAIN VALUES (2004)	Use this function to indicate which "calculated main value" from the measured values of both channels is displayed. The option CALCULATED VOLUME FLOW must be selected in the ASSIGN function (2200, main line), (2400, additional line), (2600, information line) so that the value appears in the line required. ✎ Note! This function does **not** appear if OFF was selected on at least one channel in the MEASUREMENT (6880) function. **Options:** (CH1 + CH2) · 1/2 CH1 + CH2 CH1 – CH2 **Factory setting:** (CH1 + CH2) · 1/2

5.1.2 Function group UNLOCKING/LOCKING



Function description USER INTERFACE → CONTROL → UNLOCKING/LOCKING	
ACCESS CODE (2020)	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 ⊞ keys in any function, the measuring system automatically goes to this function and the prompt to enter the code appears on the display (when programming is disabled). You can enable programming by entering your private code (**factory setting = 93**, see the DEFINE PRIVATE CODE (2021) 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 defined private code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.
DEFINE PRIVATE CODE (2021)	Use this function to specify a personal code for enabling programming in the function ACCESS CODE. **User input:** 0...9999 (max. 4-digit number) **Factory setting:** 93 ✎ Note! • Programming is always enabled with the code “0”. • 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 private code without your knowledge and consent.
STATUS ACCESS (2022)	Use this function to check the access status for the function matrix. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)

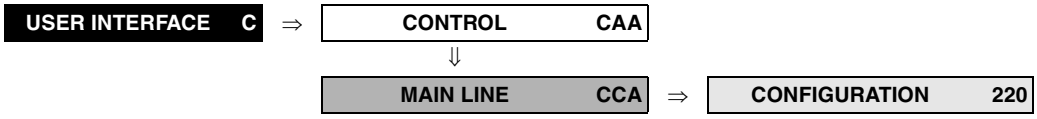
5.1.3 Function group OPERATION

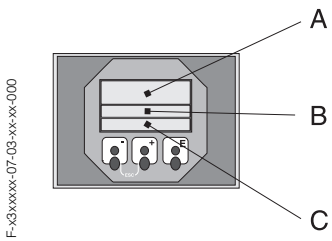


Function description USER INTERFACE → CONTROL → OPERATION	
TEST DISPLAY (2040)	Use this function to test the operability of the local display and its pixels. **Options:** OFF ON **Factory setting:** OFF Test sequence: 1. Start the test by selecting ON. 2. All pixels of the main line, additional line and information line are darkened for min. 0.75 seconds. 3. Main line, additional line and information line show an “8” in each field for min. 0.75 seconds. 4. Main line, additional line and information line show a “0” in each field for min. 0.75 seconds. 5. Main line, additional line and information line show nothing (blank display) for minimum 0.75 seconds. When the test completes the local display returns to its initial state and the setting changes to OFF.

5.2 Group MAIN LINE

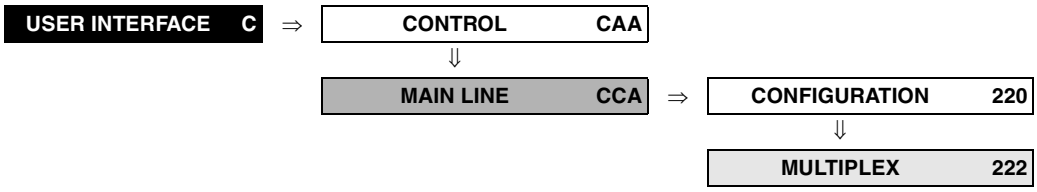
5.2.1 Function group CONFIGURATION



Function description USER INTERFACE → MAIN LINE → CONFIGURATION	
 A = main line, B = additional line, C = information line	
ASSIGN (2200)	Use this function to define the display value assigned to the main line (the top line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOCITY AVERAGE SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 ✎ Note! • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT (6880) function. • If PROFILE GSD was selected in the SELECTION GSD (6140) function the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE **Factory setting:** VOLUME FLOW CH1

Function description USER INTERFACE → MAIN LINE → CONFIGURATION	
100% VALUE (2201)	✎ Note! This function is only available if VOLUME FLOW IN % or CALCULATED VOLUME FLOW IN % was selected in the ASSIGN (2200) 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
FORMAT (2202)	Use this function to define the maximum number of places after the decimal point for the value displayed 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.

5.2.2 Function group MULTIPLEX

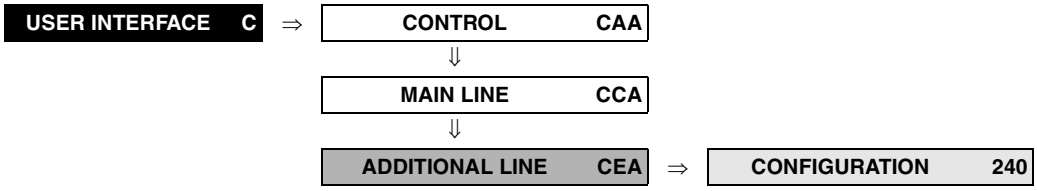


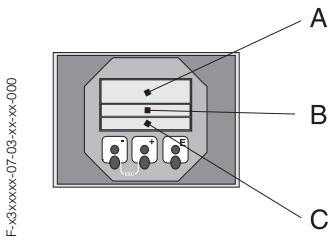
Function description USER INTERFACE → MAIN LINE → MULTIPLEX	
ASSIGN (2220)	Use this function to define the second reading to be displayed in the main line alternately (every 10 seconds) with the value defined in the ASSIGN (2200) function. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOCITY AVERAGE SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 ✎ Note! • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT (6880) function. • If PROFILE GSD was selected in the SELECTION GSD (6140) function the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE **Factory setting:** OFF
100% VALUE (2221)	✎ Note! This function is only available if VOLUME FLOW IN % or CALCULATED VOLUME FLOW IN % was selected in the ASSIGN (2200) 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 → MAIN LINE → MULTIPLEX	
FORMAT **(2222)**	Use this function to define the maximum number of places after the decimal point for the second value displayed 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.

5.3 Group ADDITIONAL LINE

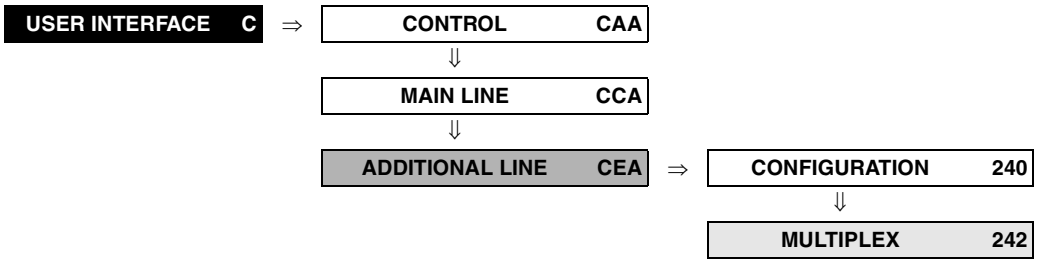
5.3.1 Function group CONFIGURATION



Function description USER INTERFACE → ADDITIONAL LINE → CONFIGURATION	
 A = main line, B = additional line, C = information line	
ASSIGN (2400)	Use this function to define the display value assigned to the additional line (the middle line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOCITY AVERAGE SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** TOT. OUT VALUE 1 ✎ Note! • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT (6880) function. • If PROFILE GSD was selected in the SELECTION GSD (6140) function the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE

Function description USER INTERFACE → ADDITIONAL LINE → CONFIGURATION	
100% VALUE (2401)	✎ Note! This function is not available unless one of the following options was selected in the ASSIGN (2400) function. • VOLUME FLOW IN % • VOLUME FLOW BARGRAPH IN % • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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
FORMAT (2402)	✎ Note! This function is not available unless a numerical option was selected in the ASSIGN (2400) function. Use this function to define the maximum number of places after the decimal point for the value displayed in the additional 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.
DISPLAY MODE (2403)	✎ Note! This function is not available unless VOLUME FLOW BARGRAPH IN % or CALCULATED VOLUME FLOW BARGRAPH % was selected in the ASSIGN (2420) function. Use this function to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD

5.3.2 Function group MULTIPLEX

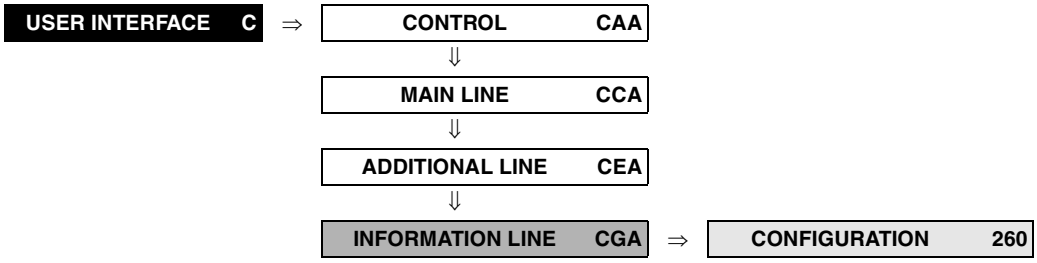


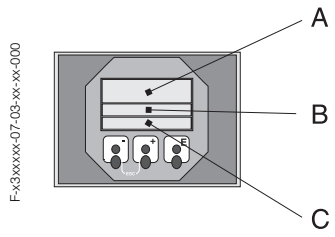
Function description USER INTERFACE → ADDITIONAL LINE → MULTIPLEX	
ASSIGN (2420)	Use this function to define the second reading to be displayed in the additional line alternately (every 10 seconds) with the value defined in the ASSIGN (2400) function. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOCITY AVERAGE SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** OFF ✎ Note! • Multiplex mode is suspended as soon as a fault/notice message is generated. • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT (6880) function. • If PROFILE GSD was selected in the SELECTION GSD (6140) function the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE

Function description USER INTERFACE → ADDITIONAL LINE → MULTIPLEX	
100% VALUE (2421)	✎ Note! This function is not available unless one of the following options was selected in the ASSIGN (2420) function: • VOLUME FLOW IN % • VOLUME FLOW BARGRAPH IN % • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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
FORMAT (2422)	✎ Note! This function is not available unless a numerical option was selected in the ASSIGN (2420) function: Use this function to define the maximum number of places after the decimal point for the second value displayed in the additional 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.
DISPLAY MODE (2423)	✎ Note! This function is not available unless VOLUME FLOW BARGRAPH IN % or CALCULATED VOLUME FLOW BARGRAPH % was selected in the ASSIGN (2420) function. Use this function to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD

5.4 Group INFORMATION LINE

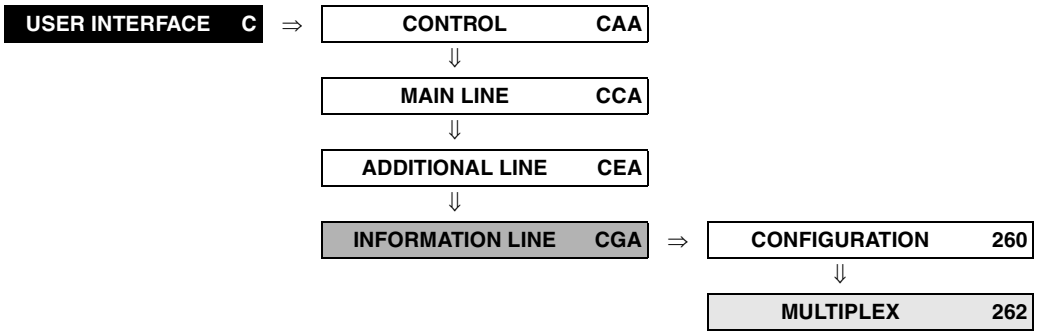
5.4.1 Function group CONFIGURATION



Function description USER INTERFACE ➞ INFORMATION LINE ➞ CONFIGURATION	
 A = main line, B = additional line, C = information line	
ASSIGN (2600)	Use this function to define the display value assigned to the information line (the bottom line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOCITY AVERAGE SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME OPERATING/SYSTEM CONDITION FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** OPERATING/SYSTEM CONDITION ✎ Note! • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT (6880) function. • If PROFILE GSD was selected in the SELECTION GSD (6140) function the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE

Function description USER INTERFACE → INFORMATION LINE → CONFIGURATION	
100% VALUE (2601)	✎ Note! This function is not available unless one of the following options was selected in the ASSIGN (2400) function: • VOLUME FLOW IN % • VOLUME FLOW BARGRAPH IN % • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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
FORMAT (2602)	✎ Note! This function is not available unless a numerical option was selected in the ASSIGN (2600) function: Use this function to define the maximum number of places after the decimal point for the value displayed in the information 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.
DISPLAY MODE (2603)	✎ Note! This function is not available unless VOLUME FLOW BARGRAPH IN % or CALCULATED VOLUME FLOW BARGRAPH % was selected in the ASSIGN (2600) function. Use this function to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD

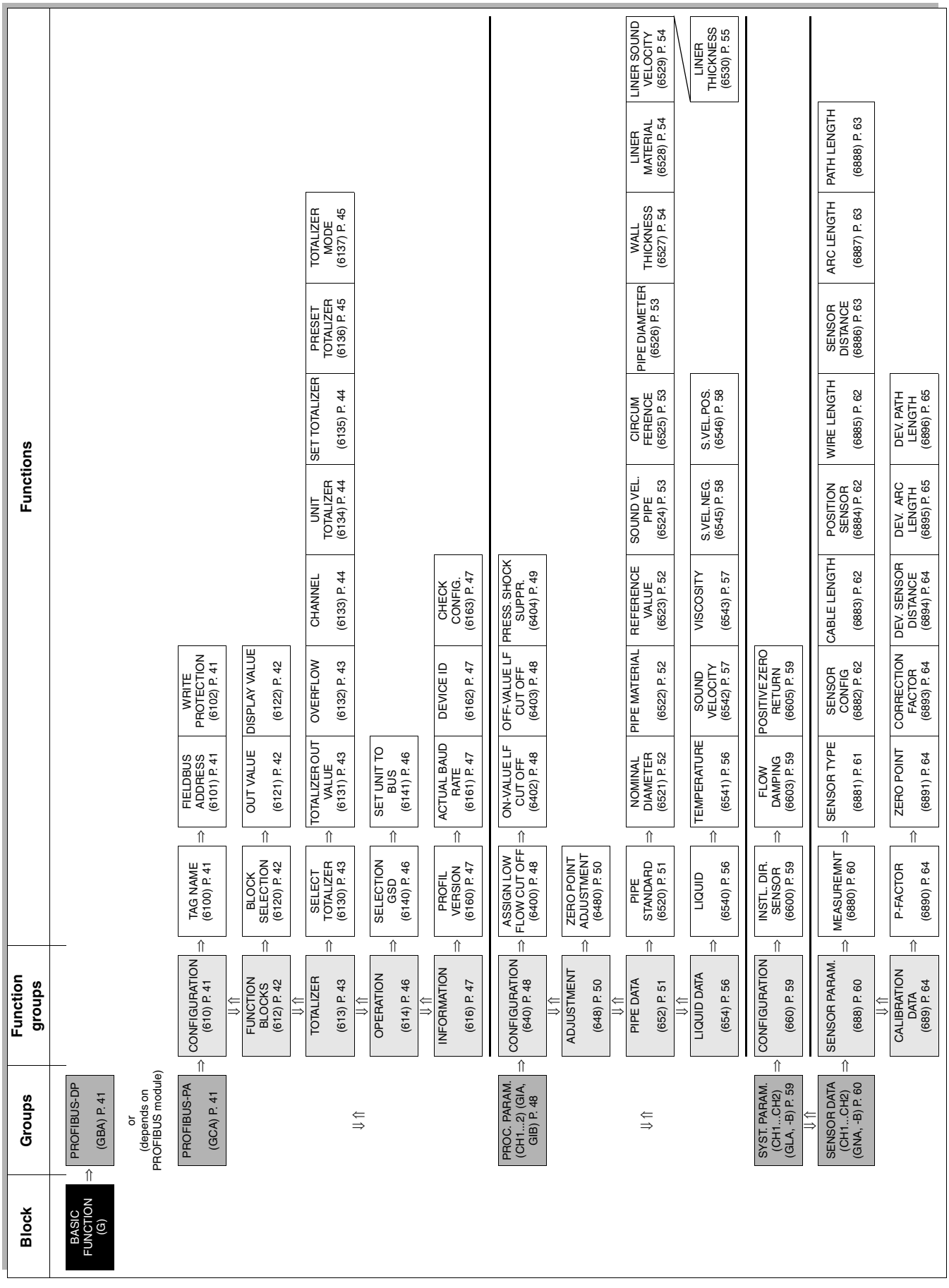
5.4.2 Function group MULTIPLEX



Function description USER INTERFACE → INFORMATION LINE → MULTIPLEX	
ASSIGN (2620)	Use this function to define the second reading to be displayed in the information line alternately (every 10 seconds) with the value defined in the ASSIGN (2600) function. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOCITY AVERAGE SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % (CH1...CH2) SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME OPERATING/SYSTEM CONDITION FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** OFF ✎ Note! • Multiplex mode is suspended as soon as a fault/notice message is generated. • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT (6880) function. • If PROFILE GSD was selected in the SELECTION GSD (6140) function the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE

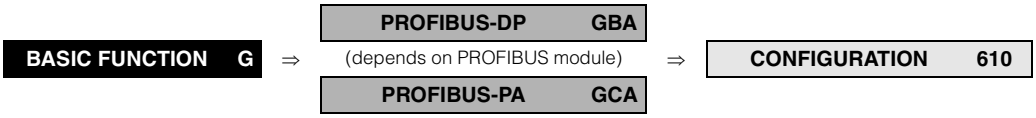
Function description USER INTERFACE → INFORMATION LINE → MULTIPLEX	
100% VALUE (2621)	✎ Note! This function is not available unless one of the following options was selected in the ASSIGN (2400) function: • VOLUME FLOW IN % • VOLUME FLOW BARGRAPH IN % • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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
FORMAT (2622)	✎ Note! This function is not available unless a numerical option was selected in the ASSIGN (2600) function: Use this function to define the maximum number of places after the decimal point for the second value displayed in the information 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.
DISPLAY MODE (2623)	✎ Note! This function is not available unless VOLUME FLOW BARGRAPH IN % or CALCULATED VOLUME FLOW BARGRAPH % was selected in the ASSIGN (2620) function. Use this function to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD

6 Block BASIC FUNCTION



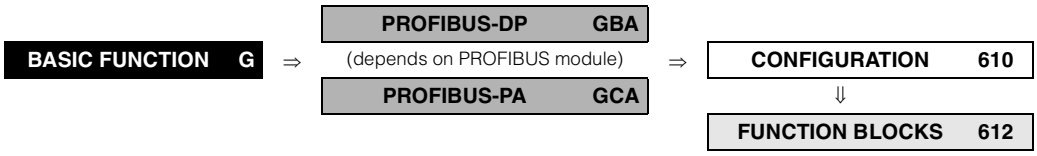
6.1 Group PROFIBUS-DP / PROFIBUS-PA

6.1.1 Function group CONFIGURATION



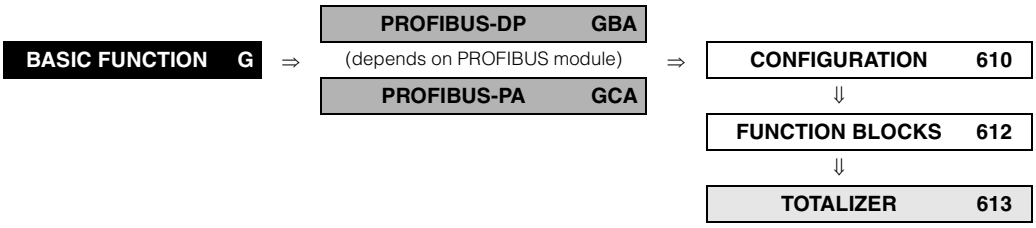
Function description BASIC FUNCTION → PROFIBUS-DP / PROFIBUS-PA → CONFIGURATION	
TAG NAME (6100)	Use this function to assign a tag name to the measuring device. You can edit and read this tag name via the local operation or by means of the PROFIBUS protocol (Class 2 master). **User input:** Max. 16-character text, permissible: A–Z, 0–9, +, –, punctuation marks **Factory setting:** "_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _" (no text)
FIELDBUS ADDRESS (6101)	Use this function to define the address for the exchange of data with the aid of the PROFIBUS-DP/-PA protocol. **User input:** 0...126 **Factory setting:** 126
WRITE PROTECTION (6102)	Use this function to display the position of the jumper used to set general write protection. **Display:** OFF → Write protection disabled ON → Write protection enabled; functions cannot be changed via the local operation or by means of the PROFIBUS protocol (Class 2 master). **Factory setting:** OFF ✎ Note! Write protection is activated and deactivated by means of a jumper on the I/O module (see Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*).

6.1.2 Function group FUNCTION BLOCKS



Function description BASIC FUNCTION → PROFIBUS-DP / PROFIBUS-PA → FUNCTION BLOCKS	
BLOCK SELECTION (6120)	Use this function to select 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 (6121) function. – If you select the Analog Output (display value), the current measured value is displayed in the DISPLAY VALUE (6122) function. **Options:** ANALOG INPUT 1 (factory setting: volume flow CH1) ANALOG INPUT 2 (factory setting: sound velocity CH1) ANALOG INPUT 3 (factory setting: flow velocity CH1) ANALOG INPUT 4 (factory setting: volume flow CH2) ANALOG INPUT 5 (factory setting: sound velocity CH2) ANALOG INPUT 6 (factory setting: flow velocity CH2) ANALOG INPUT 7 (factory setting: average volume flow) ANALOG INPUT 8 (factory setting: volume flow sum) ANALOG OUTPUT 1 (factory setting: display value) **Factory setting:** ANALOG INPUT 1 (volume flow CH1) ✎ Note! If PROFILE GSD was selected in the SELECTION GSD (6140) function, the only options available in this function are: ANALOG INPUT 1 ANALOG INPUT 2
OUT VALUE (6121)	✎ Note! This function is not available unless one of the following options was selected in the BLOCK SELECTION (6120) function: • ANALOG INPUT 1 • ANALOG INPUT 2 • ANALOG INPUT 3 • ANALOG INPUT 4 • ANALOG INPUT 5 • ANALOG INPUT 6 • ANALOG INPUT 7 • ANALOG INPUT 8 Use this function to display the OUT value (output measured value) including unit and status for the Analog Input function block selected in the BLOCK SELECTION (6120) function.
DISPLAY VALUE (6122)	✎ Note! This function is not available unless ANALOG OUTPUT 1 was selected in the BLOCK SELECTION (6120) function. Use this function to view the display value (output measured value) including unit and status.

6.1.3 Function group TOTALIZER

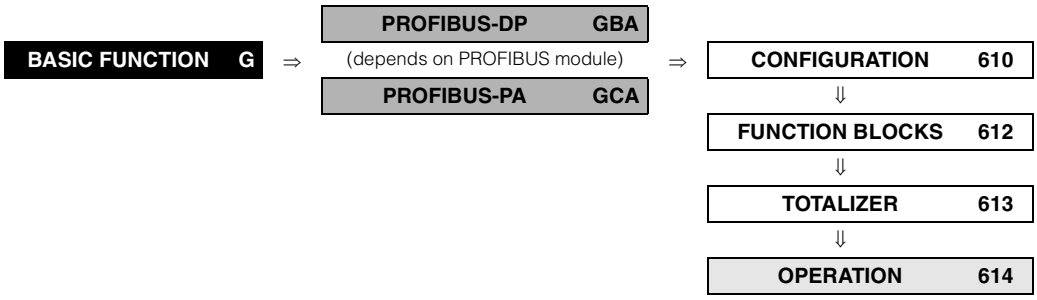


Function description BASIC FUNCTION → PROFIBUS-DP / PROFIBUS-PA → TOTALIZER	
SELECT TOTALIZER (6130)	Use this function to select a totalizer. **Options:** TOTALIZER 1 TOTALIZER 2 TOTALIZER 3 **Factory setting:** TOTALIZER 1 ✎ Note! If PROFILE GSD was selected in the SELECTION GSD (61401) function, the only options available in this function is TOTALIZER 1.
TOTALIZER OUT VALUE (6131)	Use this function to display the OUT value (output measured value) including unit and status for the totalizer selected in the SELECT TOTALIZER (6130) function.
OVERFLOW (6132)	Use this function to view the overflow for the totalizer aggregated since measuring commenced. Total flow quantity is represented by a floating-point number consisting of max. 7 digits. You can use this function to view higher numerical values (>9,999,999) as overflows. The effective quantity is thus the total of the OVERFLOW plus the value returned by the SUM function. Example: Reading for 2 overflows: 2 10^7 m^3 (= 20 m^3). The value displayed in the SUM function = 196,845.7 m^3 Effective total quantity = 20,196,845.7 m^3 **Display:** Integer with exponent, including sign (e.g. 2 E ^{7})

Function description BASIC FUNCTION → PROFIBUS-DP / PROFIBUS-PA → TOTALIZER	
CHANNEL (6133)	Use this function to assign a measured variable to the totalizer. **Options:** OFF VOLUME FLOW CH1 VOLUME FLOW CH2 VOLUME FLOW AVERAGE VOLUME FLOW SUM (CH1+CH2) VOLUME FLOW DIFFERENCE (CH1–CH2) **Factory setting:** VOLUME FLOW CH1 ✎ Note! • The totalizer is reset to “0” as soon as the selection is changed. • If only one channel is active, the only options that appear in this function are VOLUME FLOW CH1/CH2 and OFF.
UNIT TOTALIZER (6134)	Use this function to define a unit for the totalizer's measured variable. **Options:** Metric → cm^3; dm^3; m^3; ml; l; hl; Ml US → cc; af; ft^3; oz f; gal; Mgal; bbl (normal fluids); bbl (beer); bbl (petrochemicals); bbl (filling tanks) Imperial → gal; Mgal; bbl (beer); bbl (petrochemicals) **Factory setting:** m^3
SET TOTALIZER (6135)	Use this function to assign a status to the totalizer. **Options:** TOTALIZE Total the measured variable selected in the CHANNEL(6133) function. RESET Reset the totalizer to zero. PRESET The totalizer is set to the value defined in the PRESET TOTALIZER (6136) function. ✎ Note! Note that selecting RESET or PRESET resets the totalizer to “0” or sets it to the preset value, respectively, but does not stop the totalizer. This means that it immediately recommences totalling from the new setting. If you want to stop the totalizer, you must select HOLD VALUE in the TOTALIZER MODE (6137) function. **Factory setting:** TOTALIZE

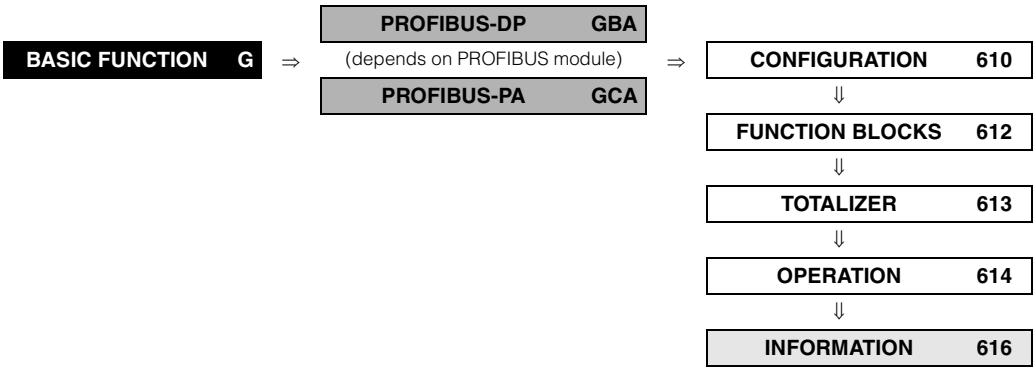
Function description BASIC FUNCTION → PROFIBUS-DP / PROFIBUS-PA → TOTALIZER	
PRESET TOTALIZER (6136)	Use this function to define a start value for the totalizer. ✎ Note! The totalizer does not accept this value unless PRESET was selected in the SET TOTALIZER (6135) function. **User input:** –99999...99999 **Factory setting:** 0
TOTALIZER MODE (6137)	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 The totalizer stops. No further flow components are totalled. **Factory setting:** Totalizer 1: BALANCE Totalizer 2: FORWARD / POSITIVE Totalizer 3: REVERSE / NEGATIVE

6.1.4 Function group OPERATION



Function description BASIC FUNCTION → PROFIBUS-DP / PROFIBUS-PA → OPERATION	
SELECTION GSD (6140)	✎ 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
SET UNIT TO BUS (6141)	Use this function to enable transmission of the preset system units to the automation system. Press the E key to transmit the preset system units to the automation system. **Options:** SET UNITS (pressing the E key starts the transmission) ✎ Note! When transmission takes place, the OUT value in the Analog Input Block is automatically scaled to the set 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 *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*. ☝ Caution! Activating this function can cause the OUT value to change suddenly; this, in turn, can affect subsequent control routines.

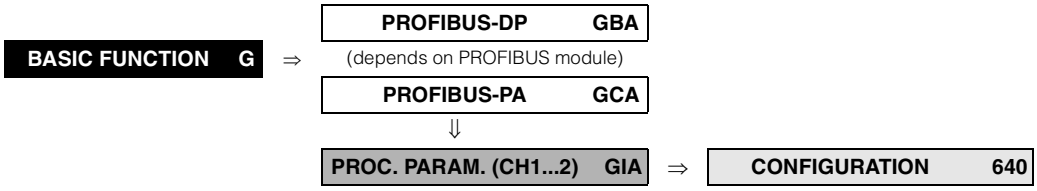
6.1.5 Function group INFORMATION

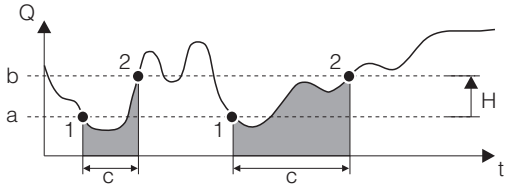


Function description BASIC FUNCTION ➞ PROFIBUS-DP / PROFIBUS-PA ➞ FUNCTION BLOCKS	
PROFIL VERSION (6160)	Use this function to view the profile version.
ACTUAL BAUD RATE (6161)	Use this function to view the data transmission rate at which the device communicates, as set in the automation system.
DEVICE ID (6162)	Use this function to view the manufacturer-specific device ID. **Display:** • PROFIBUS-DP communication output = 1531 Hex • PROFIBUS-PA communication output = 1530 Hex ✎ Note! If PROFILE GSD was selected in the SELECTION GSD (6140) function the PROFILE ID = 9741 Hex is displayed in this function.
CHECK CONFIGURATION (6163)	Use this function to check whether the configuration of a Class 1 master has been accepted for cyclic data exchange by Prosonic Flow 93 PROFIBUS. **Display:** ACCEPTED (configuration accepted) NOT ACCEPTED (configuration not accepted)

6.2 Group PROCESS PARAMETER (CH1...2)

6.2.1 Function group CONFIGURATION



Function description BASIC FUNCTION ➞ PROC. PARAM. (CH1...2) ➞ CONFIGURATION	
ASSIGN LOW FLOW CUT OFF (6400)	Use this function to assign the switch point for the low flow cut off. **Options:** OFF VOLUME FLOW **Factory setting:** VOLUME FLOW
ON-VALUE LOW FLOW CUT OFF (6402)	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:** 0 l/s ✎ Note! The appropriate unit is taken from the UNIT VOLUME FLOW (0402) function (see Page 15).
OFF-VALUE LOW FLOW CUT OFF (6403)	Use this function to specify the switch-off point for low flow cut off. Enter the switch-off point (b) as a positive hysteresis (H) from the switch-on point (a). **User input:** 0...100% **Factory setting:** 50% Example:  Q = Flow [volume/time], H = hysteresis, t = time a = ON-VALUE LOW FLOW CUT OFF (6402) = 200 l/s b = OFF-VALUE LOW FLOW CUT OFF (6403) = 10% c = Low flow cut off active 1 = Low flow cut off is switched on at 200 l/s 2 = Low flow cut off is switched off at 220 l/s

Function description

BASIC FUNCTION → PROC. PARAM. (CH1...2) → CONFIGURATION

PRESSURE SHOCK SUPPRESSION (6404)

The closure of a valve can cause brief but severe movements of the liquid in the piping system, movements which the measuring system registers. The pulses totalled in this way result in a totalizer reading error, particularly in the case of batching processes. For this reason, the measuring device is equipped with pressure shock suppression (= short-term signal suppression) which can eliminate system-related “disruptions”.

✎ Note!
Pressure shock suppression cannot be used unless the low flow cut off is active (see ON-VALUE LOW FLOW CUT OFF function on Page 48).

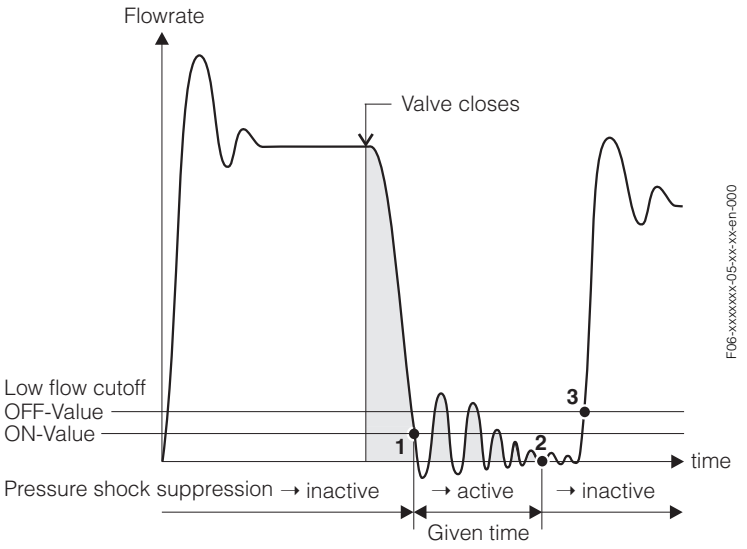
Use this function to define the time span for active pressure shock suppression.

Activation of the pressure shock suppression
Pressure shock suppression is activated after the flow undershoots the switch-on point of the low flow cut off (see point **1** in graphic).

While pressure shock suppression is active, the following conditions apply:
- Flow reading → 0
- Totalizer reading → The totalizers are pegged at the last valid value.

Deactivation of the pressure shock suppression
The pressure shock suppression is deactivated after the time interval, set in this function, has passed (see point **2** in graphic).

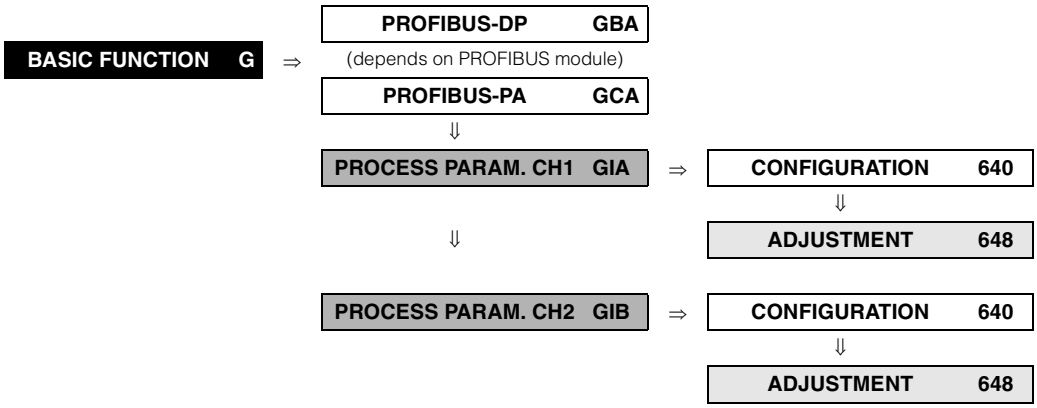
✎ Note!
The current flow value is only processed and displayed again once the time interval for the pressure shock suppression has elapsed and the flow exceeds the off-value for low flow cut off (see point **3** in graphic).



User input:
Max. 4-digit number, incl. unit: 0.00...100.0 s

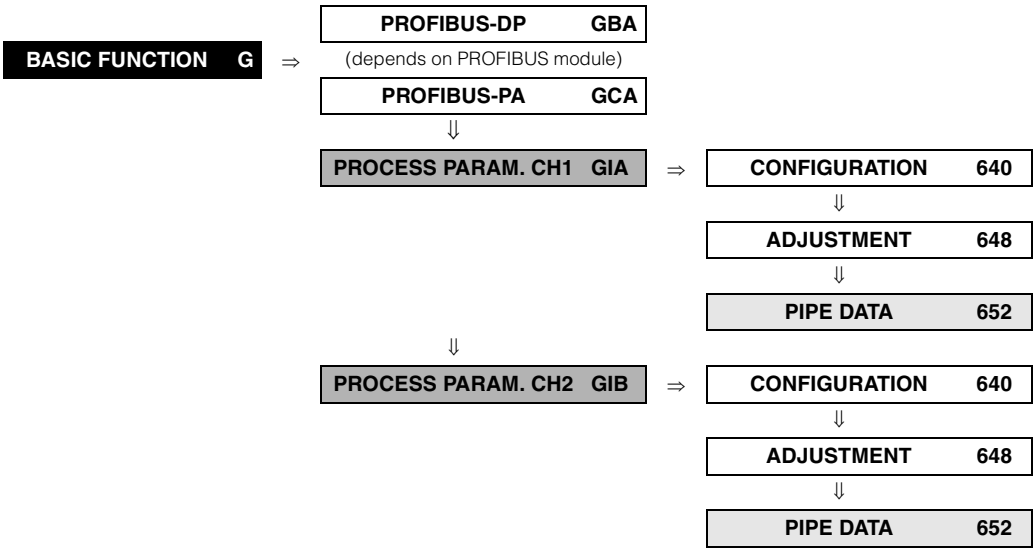
Factory setting:
0.00 s

6.2.2 Function group ADJUSTMENT



Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → ADJUSTMENT	
ZERO POINT ADJUSTMENT (6480)	Use this function to start zero point adjustment automatically. The new zero point determined by the measuring system is adopted by the ZERO POINT function (see Page 64). **User input:** CANCEL START **Factory setting:** CANCEL Caution! Before carrying this out, please refer to the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en* for a detailed description of the procedure for zero point adjustment. Note! • Programming is locked during zero point adjustment. The message “ZERO ADJUST RUNNING” appears on the display. • If the zero point adjustment is not possible (e.g. if v > 0.1 m/s) or has been cancelled, then the alarm “ZERO ADJUST NOT POSSIBLE” is shown on the display.

6.2.3 Function group PIPE DATA



Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → PIPE DATA	
PIPE STANDARD (6520)	Use this function to select a pipe standard. **Options:** OTHER DIN: PN10, PN16, 28610, 28614, 28615, 28619 ANSI: SCHEDULE 40, SCHEDULE 80 AWWA: CLASS 50, CLASS 53, CLASS 55, ✎ Note! The selection specifies the values for the following functions: • PIPE MATERIAL • SOUND VELOCITY PIPE • LINER MATERIAL If you edit these functions the pipe standard will be reset to the option OTHERS. **Factory setting:** DIN PN10

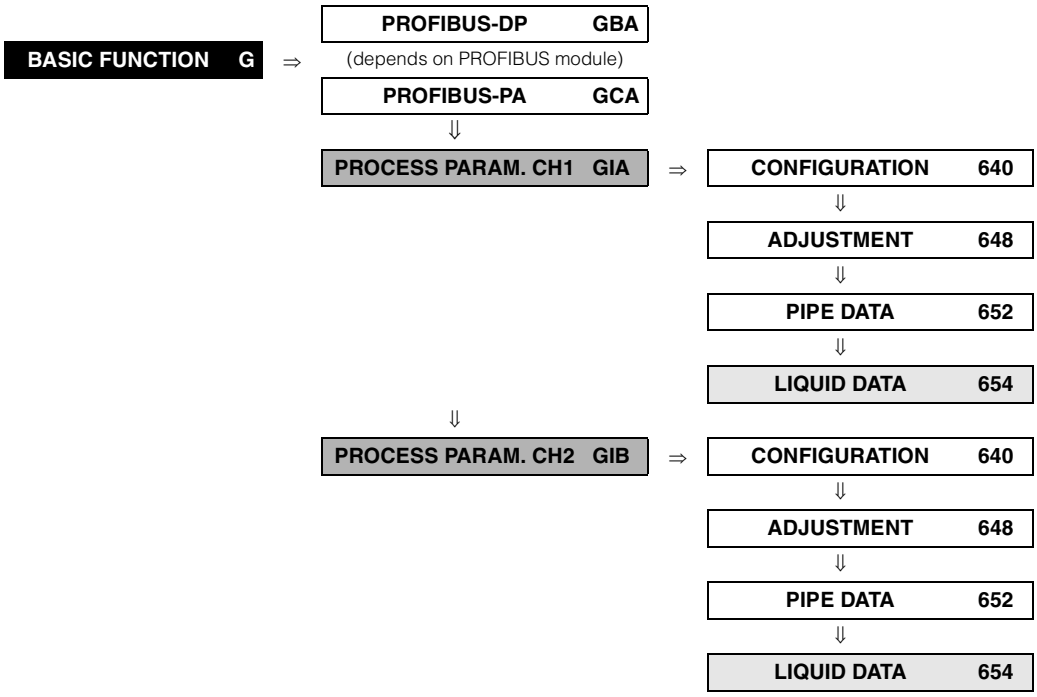
Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → PIPE DATA	
NOMINAL DIAMETER (6521)	✎ Note! This function does not appear if the option OTHERS was selected in the function PIPE STANDARD. Use this function to select the nominal diameter of the pipe. **Options:** OTHER DN: 25/1", 40/1½", 50/2", 80/3", 100/4", 150/6", 200/8", 250/10", 300/12", 400/16", 450/18", 500/20", 600/24", 700/28", 750/30", 800/32", 900/36", 1000/40", 1200/48", 1400/54", 1500/60", 1600/64", 1800/72", 2000/80" ✎ Note! The selection specifies the values for the following functions: • CIRCUMFERENCE • PIPE DIAMETER • WALL THICKNESS If you edit these functions the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER does not appear. **Factory setting:** 80/3"
PIPE MATERIAL (6522)	This function displays the pipe material determined via the values entered in the function PIPE STANDARD**.** If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER does not appear.. If a pipe standard was not available for selection and the selection OTHER was made in the function PIPE STANDARD the pipe material must be entered here. **Options:** CARBON STEEL, DUCTILE IRON, STAINLESS STEEL, SS ANSI 304, SS ANSI 316, SS ANSI 347, SS ANSI 410, SS ANSI 430, HASTELLOY C, PVC, PE, LDPE, HDPE, GRP, PVDF, PA, PP, PTFE, GLASS PYREX, ASBESTOS CEMENT, OTHER **Factory setting:** STAINLESS STEEL
REFERENCE VALUE (6523)	Use this function to specify the thickness of the reference component (e.g. flange) as the basis for measuring the sound velocity of the pipe. ✎ Note! This function does not appear unless SOUND VELOCITY PIPE was selected in the MEASUREMENT (6880, Page 60) function. **User input:** 5-digit floating-point number, [unit] **Factory setting:** 5 mm

Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → PIPE DATA	
SOUND VELOCITY PIPE (6524)	This function displays the sound velocity in the pipe determined via the value entered in the function PIPE STANDARD (6520). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER (6521) does not appear. If a pipe standard was not available for selection and the selection OTHER was made in the function PIPE STANDARD (6520) the sound velocity must be entered here. **Measuring the sound velocity in the pipe** If the sound velocity in the pipe is not known, it can be measured. To do so, SOUND VELOCITY PIPE must be set in the MEASUREMENT (6880, Page 60) function. The sound velocity in the pipe is measured by calling up the SOUND VELOCITY PIPE (6524) function. The measured sound velocity, the signal strength and a bar graph appear on the local display. The measurement is valid if 100% is achieved in the bar graph. If you confirm the function with the E key, the SAVE prompt appears. To accept the measured sound velocity, select the option YES by means of the + or − key. ✎ Note! • To measure the sound velocity, you require the ultrasonic sensors "DDU18" which you can order as an accessory from Endress+Hauser. • A reference value is used as a basis for measuring the sound velocity. This reference value can be edited (see function REFERENCE VALUE (6523), Page 52). **User input:** Fixed-point number 800....6500 m/s **Factory setting:** 3120 m/s
CIRCUMFERENCE (6525)	This function displays the outer circumference of the pipe determined via the values entered in the function NOMINAL DIAMETER. If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER does not appear. If a nominal diameter was not available for selection and the selection OTHER was made in the function NOMINAL DIAMETER the outer circumference must be entered here. **User input:** Fixed-point number 31.4...15708.0 mm **Factory setting:** 279.3 mm
PIPE DIAMETER (6526)	This function displays the outer diameter of the pipe determined via the values entered in the function NOMINAL DIAMETER. If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER does not appear. If a nominal diameter was not available for selection and the selection OTHER was made in the function NOMINAL DIAMETER the outer diameter must be entered here. **User input:** Fixed-point number 10.0...5000.0 mm **Factory setting:** 88.9 mm

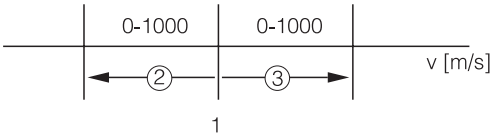
Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → PIPE DATA	
WALL THICKNESS (6527)	This function displays the thickness of the pipe wall determined via the values entered in the function NOMINAL DIAMETER. If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER does not appear. If a nominal diameter was not available for selection and the selection OTHER was made in the function NOMINAL DIAMETER the thickness of the pipe wall must be entered here. **Measuring the wall thickness** If the wall thickness is not known, it can be measured. To do so, WALL THICKNESS must be set in the MEASUREMENT (6880, Page 60) function. The wall thickness is measured by calling up the WALL THICKNESS (6527) function. The measured wall thickness, the signal strength and a bar graph appear on the local display. The measurement is valid if 100% is achieved in the bar graph. If you confirm the function with the E key, the SAVE prompt appears. To accept the measured wall thickness, select the option YES by means of the + or - key. **User input:** Fixed-point number 0.1...100.0 mm **Factory setting:** 3.2 mm
LINER MATERIAL (6528)	This function displays the liner material of the pipe determined via the values entered in the function PIPE STANDARD. If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the function NOMINAL DIAMETER does not appear. If a pipe standard was not available for selection and the selection OTHER was made in the function PIPE STANDARD the liner material must be entered here. **Options:** NO LINER MORTAR RUBBER TAR EPOXY OTHER **Factory setting:** NO LINER
SOUND VELOCITY LINER (6529)	✎ Note! This function does not appear if the option LINER NONE was selected in the function LINER MATERIAL (6528). This function displays the sound velocity of the liner determined via the value entered in the function LINER MATERIAL (6520). If you edit the predetermined value the liner material will be reset to the option OTHERS. If a liner material was not available for selection and the selection OTHER was made in the function LINER MATERIAL (6528) the sound velocity of the liner must be entered here. **User input:** Fixed-point number 800....6500 m/s **Factory setting:** Depends on the setting selected in the LINER MATERIAL (6528) function

Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → PIPE DATA	
LINER THICKNESS (6530)	✎ Note! This function does not appear if the option LINER NONE was selected in the LINER MATERIAL function Use this function to enter the thickness of the liner. **User input:** Fixed-point number 0.1...100.0 mm **Factory setting:** 0 mm

6.2.4 Function group LIQUID DATA



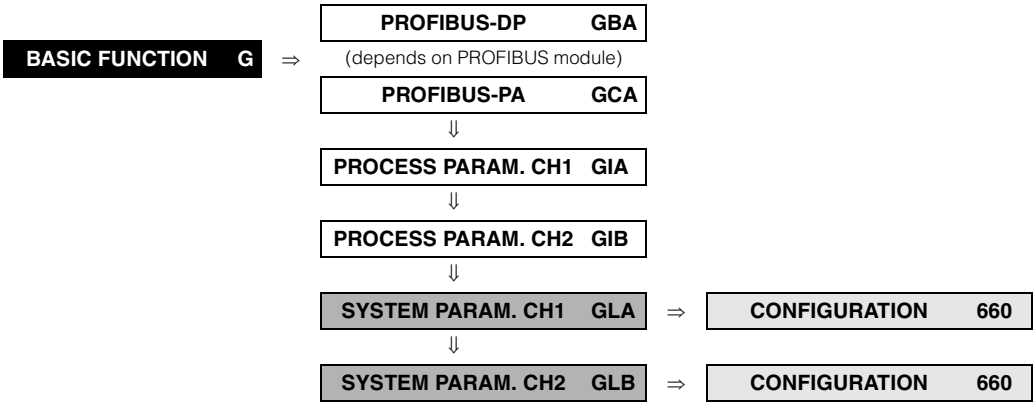
Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → LIQUID DATA	
LIQUID (6540)	Use this function to select the liquid in the pipe. **Options:** WATER, SEAWATER, DISTILLED WATER, AMMONIA, ALCOHOL, BENZENE, BROMIDE, ETHANOL, GLYCOL, KEROSENE, MILK, METHANOL, TOLUOL, LUBRICATING OIL, FUEL OIL, PETROL, OTHERS ✎ Note! The selection specifies the values for the sound velocity and viscosity. If OTHER is selected, these must be entered via the SOUND VELOCITY LIQUID (6542) and VISCOSITY (6543) functions. **Factory setting:** WATER
TEMPERATURE (6541)	Use this function to enter the process temperature of the liquid. Via the sound velocity, the value influences the determination of the sensor distance. Enter the process temperature at normal operating conditions to achieve an optimum configuration of the measuring system. **User input:** Fixed-point number –273.15...726.85 °C (0...1000 K) **Factory setting:** 20 °C

Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → LIQUID DATA	
SOUND VELOCITY LIQUID (6542)	This function displays the sound velocity of the liquid determined via the values entered in the functions LIQUID (6540) and TEMPERATURE (6541). If you edit the predetermined value the function LIQUID (6540) will be reset to the option OTHERS. If a liquid was not available for selection and the selection OTHER was made in the function LIQUID (6540) the sound velocity must be entered here. **Measuring the sound velocity of the liquid** If the sound velocity of the liquid is not known, it can be measured. To do so, SOUND VELOCITY LIQUID must be set in the MEASUREMENT (6880, Page 60) function. The sound velocity in the pipe is measured by calling up the SOUND VELOCITY LIQUID (6542) function. The measured sound velocity appears on the local display. If you confirm the function with the E key, the SAVE prompt appears. To accept the measured sound velocity, select the option YES by means of the + or - key. ✎ Note! To measure the sound velocity, you require the ultrasonic sensors "DDU18" which you can order as an accessory from Endress+Hauser. **Transmitter search range:** The measuring device searches for the measuring signal within a defined sound velocity range. You specify the search range in the SOUND VELOCITY NEGATIVE (6545) and SOUND VELOCITY POSITIVE (6546) functions. An error message is displayed if the sound velocity of the liquid exceeds the search range. ✎ Note! We recommend you select a smaller search range by unfavourable signal conditions (signal strength < 50%).  1 = Sound velocity of the liquid 2 = Lower search range: is specified in the SOUND VELOCITY NEGATIVE (6545) function 3 = Upper search range: is specified in the SOUND VELOCITY POSITIVE (6546) function **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 1487 m/s
VISCOSITY (6543)	This function displays the viscosity of the liquid. This is determined via the values entered in the LIQUID and TEMPERATURE functions.If you edit the predetermined value the function LIQUID will be reset to the option OTHERS. If the liquid is not available for selection in the LIQUID function and the OTHER option was selected the viscosity must be entered here. **User input:** Fixed-point number 0.0...5000.0 mm^2/s (cSt) **Factory setting:** 1 mm^2/s

Function description BASIC FUNCTION → PROC. PARAM. (CH1...2) → LIQUID DATA	
SOUND VELOCITY NEGATIVE (6545)	Use this function to specify the lower search range for the sound velocity of the liquid. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 800 m/s ✎ Note! Pay particular attention to the information in the SOUND VELOCITY LIQUID function.
SOUND VELOCITY POSITIVE (6546)	Use this function to specify the upper search range for the sound velocity of the liquid. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 1800 m/s ✎ Note! Pay particular attention to the information in the SOUND VELOCITY LIQUID function.

6.3 Group SYST. PARAM. (CH1...CH2)

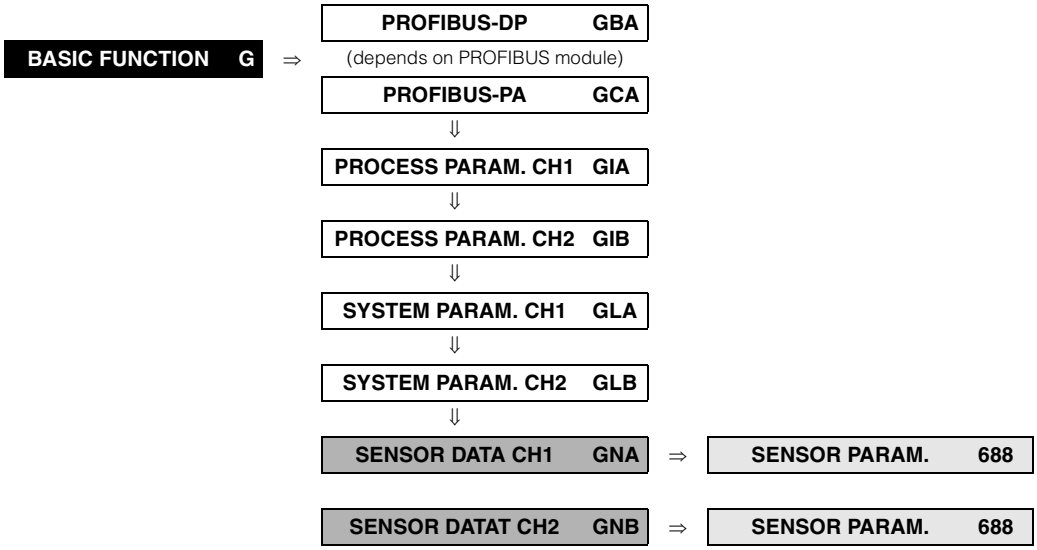
6.3.1 Function group CONFIGURATION



Function description BASIC FUNCTION → SYSTEM PARAMETER CH1 → CONFIGURATION	
INSTALLATION DIRECTION SENSOR (6600)	Use this function to reverse the sign of the flow rate variable, if necessary. **Options:** NORMAL (FORWARD) INVERSE (REVERSE) **Factory setting:** NORMAL
FLOW DAMPING (6603)	✎ Note! The system damping acts on all functions and outputs of the measuring device. Use this function to set the filter depth of the digital filter. The sensitivity of the measurement signal can be reduced with respect to interference peaks (e.g. in the event of a high solids content, gas bubbles in the fluid etc.). The system reaction time increases with the filter setting. **User input:** 0...100 s **Factory setting:** 0 s
POSITIVE ZERO RETURN (6605)	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 functions and outputs of the measuring device. **Options:** OFF ON (Signal output is set to the “zero flow” value **Factory setting:** OFF

6.4 Group SENSOR DATA (CH1...CH2)

6.4.1 Function group SENSOR PARAMETER



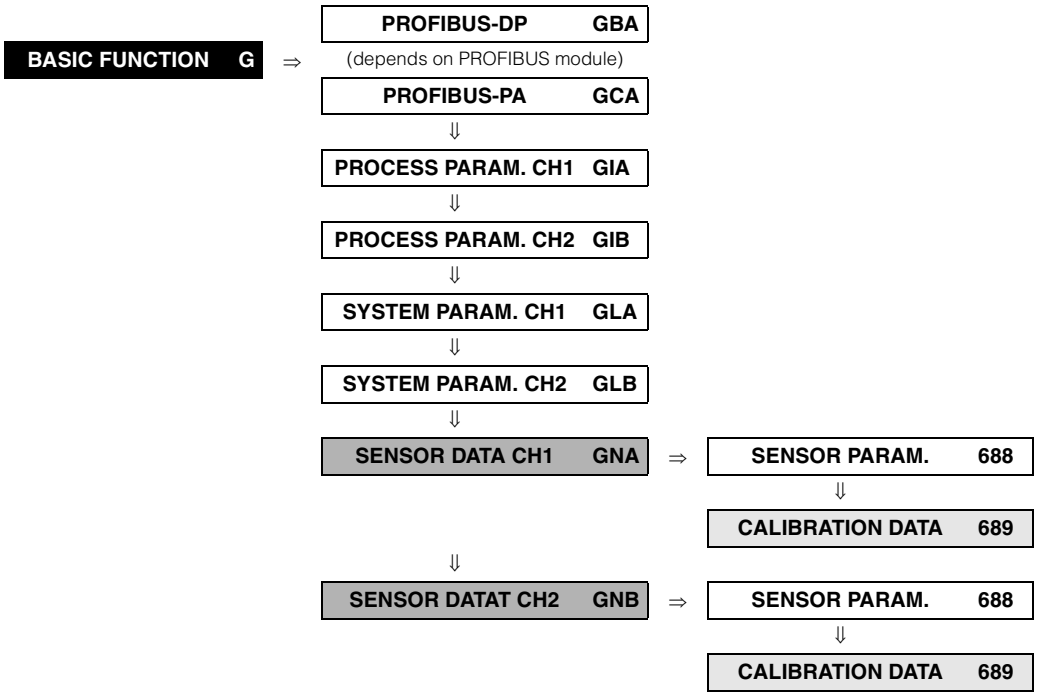
Function description BASIC FUNCTION → SENSOR DATA (CH1...CH2) → SENSOR PARAMETER	
MEASUREMENT (6880)	**Options:** OFF CLAMP ON INSERTION SOUND VELOCITY LIQUID PIPE SOUND VELOCITY WALL THICKNESS **Factory setting:** CLAMP ON (for channel 1) OFF (for channel 2)

Function description BASIC FUNCTION → SENSOR DATA (CH1...CH2) → SENSOR PARAMETER	
SENSOR TYPE (6881)	✎ Note! This function is only available if OFF was not selected in the MEASUREMENT function. **Options:** W-CL-05F-L-B [1] W-CL-1F-L-B [1] W-CL-2F-L-B [1] P-CL-05F-L-B [1] P-CL-1F-L-B [1] P-CL-2F-L-B [1] P-CL-05F-M-B [1] P-CL-1F-M-B [1] P-CL-2F-M-B [1] U-CL-2F-L-A [1] W-IN-1F-L-B [2] P-CL-1S-L-B [3] P-CL-1S-M-B [3] P-CL-4W-L-B[4] [1] This option is not available unless CLAMP ON was selected in the MEASUREMENT function. [2] This option is not available unless INSERTION was selected in the MEASUREMENT function. [3] This option is not available unless SOUND VELOCITY LIQUID was selected in the MEASUREMENT function. [4] This option is not available unless SOUND VELOCITY PIPE or WALL THICKNESS was selected in the MEASUREMENT function. **Factory setting:** W-CL-2F-L-B

Function description BASIC FUNCTION → SENSOR DATA (CH1...CH2) → SENSOR PARAMETER	
SENSOR CONFIGURATION (6882)	Use this function to select the configuration for the ultrasonic sensors, e.g. the number of traverses (in the Clamp On version) or whether single-path or dual-path configuration is present (in the Insertion version). ✎ Note! This function is not available unless one of the following options was selected in the MEASUREMENT(6880) function: • CLAMP ON • SOUND VELOCITY LIQUID • INSERTION **Options:** NO. TRAVERSE: 1 [1] NO. TRAVERSE: 2 [2] NO. TRAVERSE: 3 [1] NO. TRAVERSE: 4 [2] SINGLE PATH [3] DUAL PATH [3] [1] This option is not available unless CLAMP ON or SOUND VELOCITY LIQUID was selected in the MEASUREMENT function. [2] This option is not available unless CLAMP ON was selected in the MEASUREMENT function. [3] This option is not available unless INSERTION was selected in the MEASUREMENT function. **Factory setting:** NO. TRAVERSE: 2 ✎ Note! When using the U-Sensor it is always required to set this function to "NO. TRAVERSE: 2"
CABLE LENGTH (6883)	Use this function to select the length of the sensor cable. **Options:** LENGTH 5m/15 feet LENGTH 10m/30 feet LENGTH 15m/45 feet LENGTH 30m/90 feet **Factory setting:** LENGTH 5m/15 feet
POSITION SENSOR (6884)	Use this function to view the position of both sensors on the rail. ✎ Note! This option is not available unless CLAMP ON is set in the MEASUREMENT function and the number of traverses is 2 or 4 (see SENSOR CONFIGURATION (6882) function). **Display:** 5-digit number combination
WIRE LENGTH (6885)	The wire length for mounting the sensors at the correct distance apart appears on the display. ✎ Note! This option is not available unless CLAMP ON is set in the MEASUREMENT function and the number of traverses is 1 or 3 (see SENSOR CONFIGURATION (6882) function). **Display:** max. 5-digit number, including unit (e.g. 200 mm)

Function description BASIC FUNCTION → SENSOR DATA (CH1...CH2) → SENSOR PARAMETER	
SENSOR DISTANCE (6886)	The distance between sensor 1 and sensor 2 appears on the display as a length measurement. **Display:** max. 5-digit number, including unit (e.g. 200 mm)
ARC LENGTH (6887)	The arc length on the pipe appears on the display. ✎ Note! This function does not appear unless INSERTION is set in the MEASUREMENT (6880) function and DUAL PATH is selected in the SENSOR CONFIGURATION (6882) function. **Display:** max. 5-digit number, including unit (e.g. 200 mm)
PATH LENGTH (6888)	The path length appears on the display. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT function. **Display:** max. 5-digit number, including unit (e.g. 200 mm)

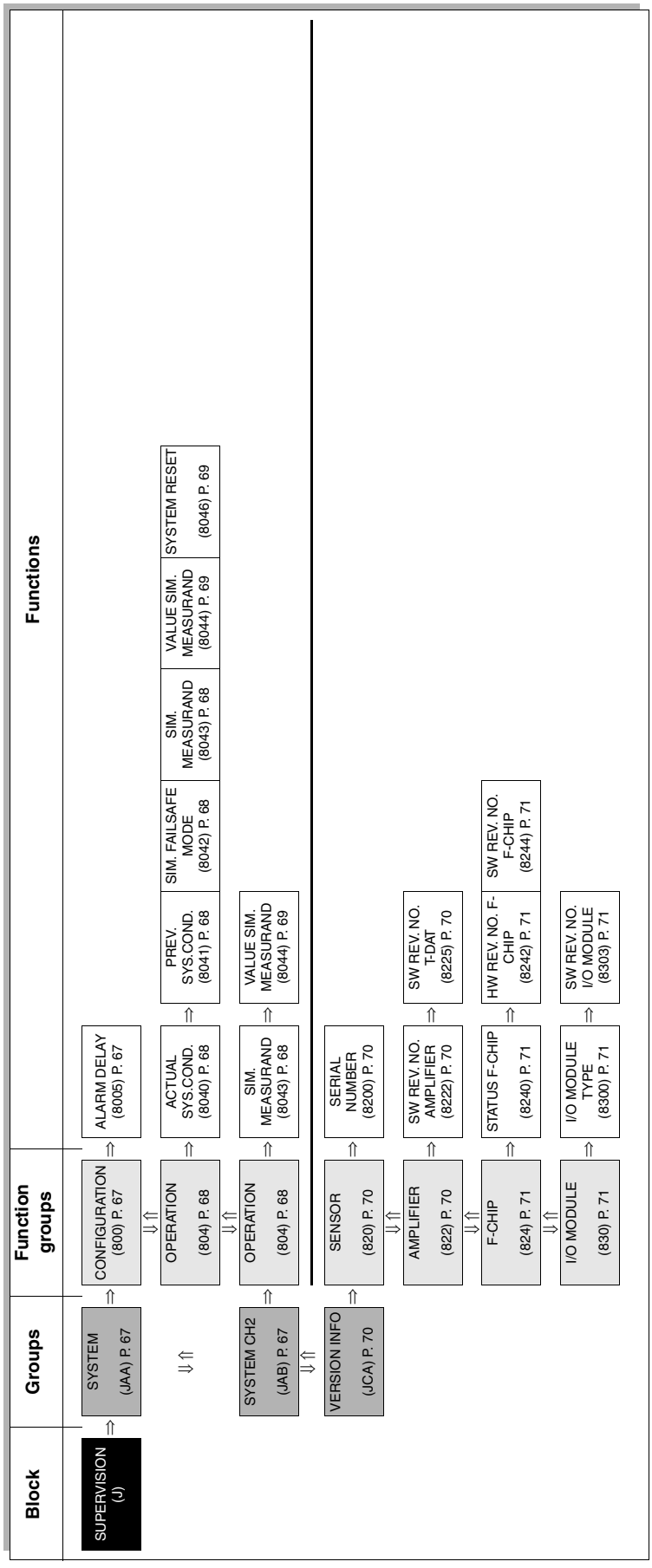
6.4.2 Function group CALIBRATION DATA



Function description BASIC FUNCTION → SENSOR DATA (CH1...CH2) → CALIBRATION DATA	
P-FACTOR (6890)	This function displays the p-factor. The p-factor indicates the influence of the velocity distribution of the flow profile inside the pipe; it is dependent on the reynolds number. The p-factor varies in the range 0.75 .. 0.95. If the displayed value ranges 0.75 .. 0.94 the measurement will have a reduced linearity..
ZERO POINT (6891)	Use this function to call up or manually change the zero point correction currently being used. **User input:** 5-digit floating-point number, including unit and sign (e.g. +10.0 ns)
CORRECTION FACTOR (6893)	Use this function to enter a correction factor at the client's site. **User input:** 5-digit floating-point number **Factory setting:** 1.0000 (no correction)
DEVIATION SENSOR DISTANCE (6894)	Use this function to enter a deviation value for the sensor distance. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT (6880) function. **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm

Function description BASIC FUNCTION → SENSOR DATA (CH1...CH2) → CALIBRATION DATA	
DEVIATION ARC LENGTH (6895)	Use this function to enter a deviation value for the arc length. ✎ Note! This function does not appear unless INSERTION is set in the MEASUREMENT (6880) function and DUAL PATH is selected in the SENSOR CONFIGURATION (6882) function. **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm
DEVIATION PATH LENGTH (6896)	Use this function to enter a deviation value for the path length. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT (6880) function. **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm

7 Block SUPERVISION



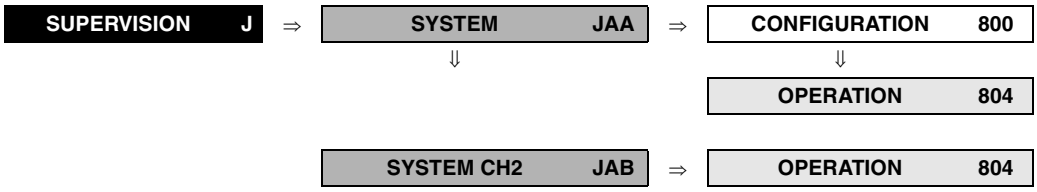
7.1 Group SYSTEM (SYSTEM CH2)

7.1.1 Function group CONFIGURATION

SUPERVISION J ⇒ SYSTEM JAA ⇒ CONFIGURATION 800

Function description SUPERVISION → SYSTEM → CONFIGURATION	
ALARM DELAY (8005)	Use this function to specify a time period for suppressing the appearance of fault or notice messages . Depending on the setting and the type of error, this suppression also acts on the local display. **User input:** 0...100 s (in steps of one second) **Factory setting:** 0 s

7.1.2 Function group OPERATION

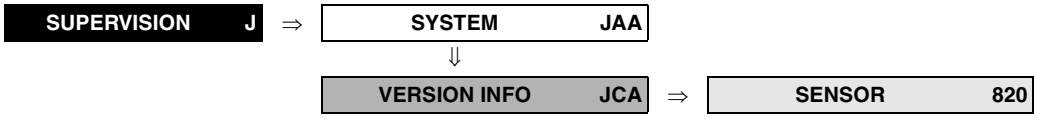


Function description SUPERVISION → SYSTEM CH2 → OPERATION	
ACTUAL SYSTEM CONDITION (8040)	Use this function to check the present system condition. **Display:** "SYSTEM OK" or the fault/notice message with the highest priority.
PREVIOUS SYSTEM CONDITIONS (8041)	Use this function to view the fifteen most recent error and notice messages since measuring last started. **Display:** The last 15 fault/notice messages appear on the display.
SIMULATION FAILSAFE MODE (8042)	Use this function to set all inputs, outputs and totalizers to their defined failsafe modes, in order to check whether they respond correctly. During this time, the message "SIMULATION FAILSAFE MODE" appear on the display. **Options:** ON OFF **Factory setting:** OFF
SIMULATION MEASURAND (8043)	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 message "SIMULATION MEASURAND" appear on the display. **Options:** OFF VOLUME FLOW (CH1...CH2) SOUND VELOCITY (CH1...CH2) **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.

Function description SUPERVISION → SYSTEM CH2 → OPERATION	
VALUE SIMULATION MEASURAND (8044)	✎ Note! This function is not displayed unless the SIMULATION MEASURAND (8043) function is active. Use this function to specify a selectable value (e.g. 12 m^3/s). This is used to test the associated functions in the device itself and downstream signal loops. **User input:** 5-digit floating-point number, [unit] **Factory setting:** 0 [unit] ☝ Caution! • The setting is not saved if the power supply fails. • The appropriate unit is taken from the SYSTEM UNITS (ACA) function group (see Page 15).
SYSTEM RESET (8046)	Use this function to perform a reset of the measuring system. **Options:** NO RESTART SYSTEM (restart without interrupting power supply) **Factory setting:** NO

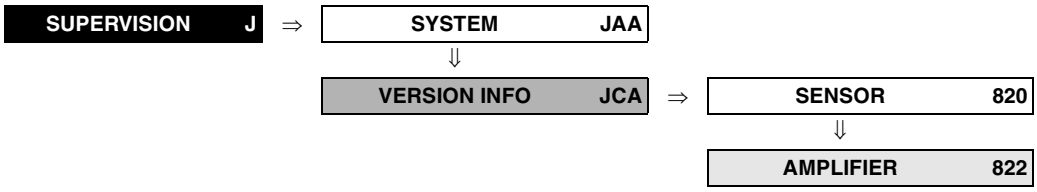
7.2 Group VERSION INFO

7.2.1 Function group SENSOR



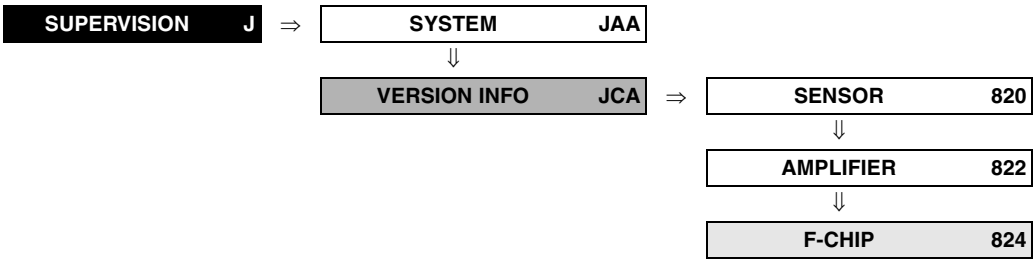
Function description SUPERVISION → VERSION INFO → SENSOR	
SERIAL NUMBER (8200)	The serial number of the sensor appears on the display.

7.2.2 Function group AMPLIFIER



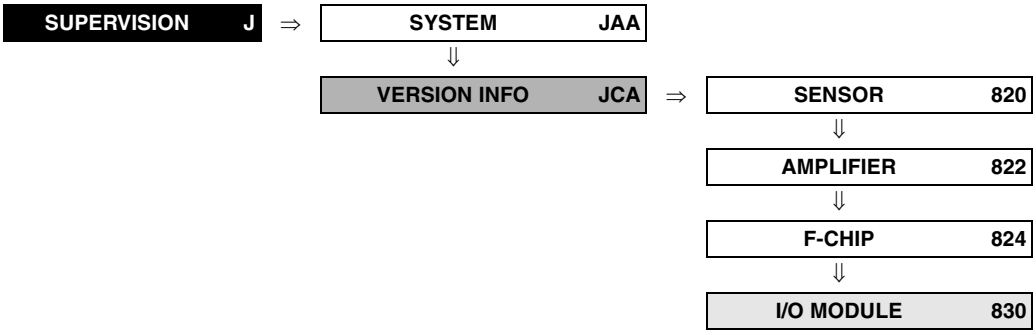
Function description SUPERVISION → VERSION INFO → AMPLIFIER	
SOFTWARE REVISION NUMBER AMPLIFIER (8222)	The software revision number of the amplifier appears on the display.
SOFTWARE REVISION NUMBER T-DAT (8225)	The software revision number of the software used to create the content of the T-DAT appears on the display.

7.2.3 Function group F-CHIP



Function description SUPERVISION → VERSION INFO → F-CHIP	
STATUS F-CHIP (8240)	Use this function to check whether an F-Chip is installed and which software options are available.
HARDWARE REVISION NUMBER F-CHIP (8242)	✎ Note! This function is not available at this time. The hardware revision number of the F-Chip appears on the display.
SOFTWARE REVISION NUMBER F-CHIP (8244)	✎ Note! This function is not available at this time. The software revision number of the F-Chip appears on the display.

7.2.4 I/O MODULE Function group



Function description SUPERVISION → VERSION INFO → I/O MODULE	
I/O MODULE TYPE (8300)	The configuration of the I/O module appears on the display.
SOFTWARE REVISION NUMBER I/O MODULE (8303)	The software revision number of the I/O module appears on the display.

8 Index function matrix

Blocks

Groups

Function groups

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2...

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Numerics

Contents (PROFIBUS-DP/-PA)

1 Operation via PROFIBUS-DP/-PA

1.1 Block model

In the PROFIBUS-DP/-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-DP/-PA device has the following block types:

- A Physical Block (device block)
  The Physical Block contains all device-specific features of the unit.

- One or several Transducer Blocks (transmission block)
  The Transducer Block contains all device-specific and measurement-related parameters for the device. The measuring principles (e.g. flow, temperature) are depicted in the Transducer Blocks in accordance with the PROFIBUS-DP/-PA Profile 3.0 Specification.

- One or several function blocks (function block)
  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 other blocks, e.g. several Analog Input function blocks if more than one process variable is available from the field device.

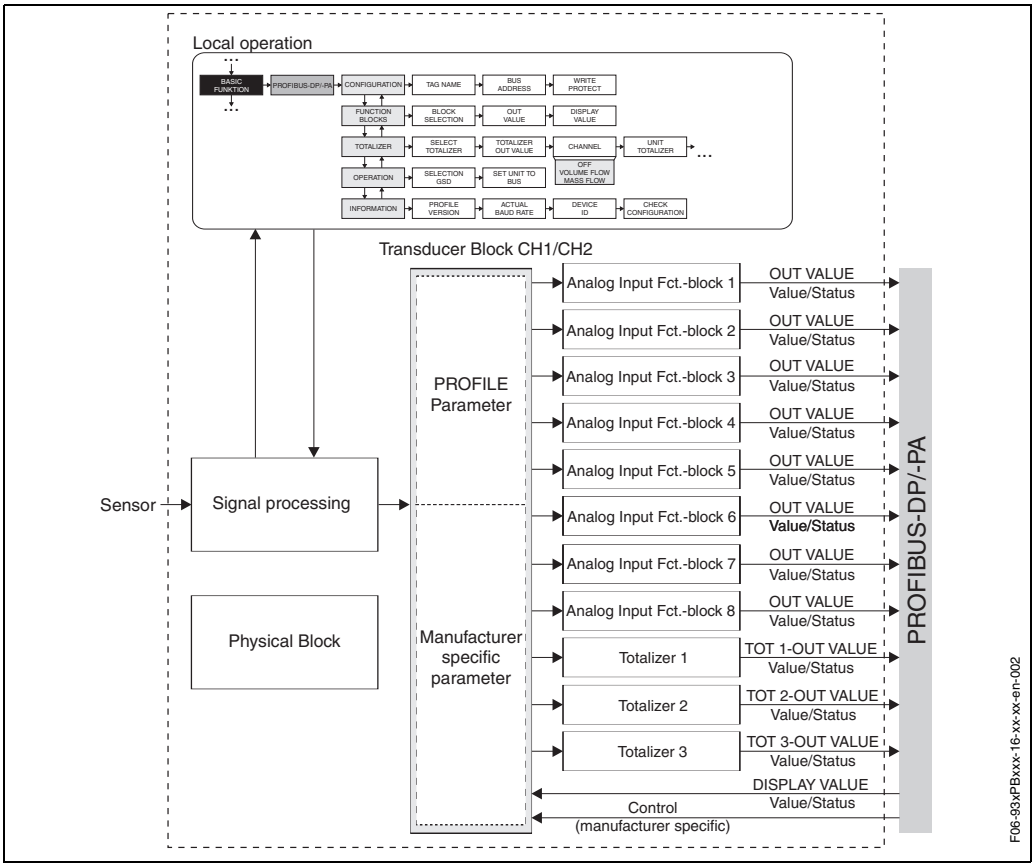


Fig. 1: Block model for Prosonic Flow 93 PROFIBUS

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

2 Physical Block (Device Block)

A Physical Block contains all the data that clearly identify and characterise the field device. It is an electronic version of a nameplate on the field device. Parameters of the Physical Block include the device type, device name, manufacturer ID, serial number, etc.

A further task of the Physical Block is the management of general 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 enabled and disabled by means of a jumper on the PROFIBUS-DP/-PA I/O board (see Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*).

The HW_WRITE_PROTECTION parameter (see Page 85) indicates the status of the 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 an entry in the WRITE_LOCKING parameter (see Page 84).

The following are the permissible entries:
2457 → Device data can be overwritten (factory setting)
0 → Device data cannot 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 parameter
  – O = Optional parameter

Physical Block (device block)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
DEVICE DATA (V0...)				
DEVICE ID (V0H0) *DEVICE_ID (0/27)*	The manufacturer-specific device ID appears on the display. **Display:** PROSONIC 93 PBUS	X		M
SERIAL NUMBER (V0H1) *SERIAL_NUM (0/28)*	The serial number of the measuring device appears on the display.	X		M
SOFTWARE VERSION (V0H2) *SOFTWARE_VERSION (0/24)*	The software version number of the measuring device appears on the display.	X		M
HARDWARE VERSION (V0H3) *HARDWARE_VERSION (0/25)*	The hardware version number of the measuring device appears on the display.	X		M
MANUFACTURER_ID (V0H4) *DEVICE_MAN_ID (0/26)*	The manufacturer's ID number appears on the display. **Display:** 17 (decimal)	X		M
DESCRIPTION (V1...)				
DESCRIPTOR (V1H0) *DESCRIPTOR (0/36)*	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 (0/38)*	Use this parameter to enter the installation date of the measuring device. **Factory setting:** No date	X	X	O
MESSAGE (V1H2) *DEVICE_MESSAGE (0/37)*	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 (0/33)*	Use this parameter to view information on certification of the measuring device. **Factory setting:** No information	X		O

Physical Block (device block)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SOFTWARE RESET (V2...)				
SOFTWARE RESET (V2H0) *FACTORY_RESET (0/35)*	Use this parameter to reset or restart the measuring device. **User input:** 0 → No action 1 → Reset all parameters to their factory settings, 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 displays 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
SECURITY LOCKING (V3...)				
WRITE LOCKING (V3H0) *WRITE_LOCKING (0/34)*	Use this parameter to enable 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

Physical Block (device block)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
HW WRITE PROTECT (V3H1) *HW_WRITE_PROTECTION (0/41)*	Write protection is enabled and disabled by means of a jumper on the I/O module (see Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*). This parameter shows the position of the jumper used to set general write protection.Display: 0 → Write protection disabled, parameters can be overwritten. 1 → Write protection enabled, parameters cannot be overwritten via local operation or by means of the PROFIBUS protocol (Class 2 master). **Factory setting:** 0	X		O
LOCAL OPERATION (V3H2)	✎ Note! This parameter is not supported by Prosonic Flow 93 PROFIBUS. Use this parameter to enable local operation.			
DEVICE DATA (V4...)				
IDENT NUMBER (V4H0) *IDENT_NUMBER_SELECTOR (0/40)*	✎ 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 Prosonic Flow 93 PROFIBUS. **Factory setting:** 1	X	X	M

Physical Block (device block)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
DIAGNOSIS MASK (V5...)				
MASK (V5H0) *DIAGNOSIS_MASK (Byte 1), (0/31)*	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), (0/31)*	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), (0/31)*	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_EXTENS. (0/32)*	Bit mask which outputs manufacturer-specific diagnosis messages appears on the display (see also system and process error messages in the Operating Instructions *Prosonic Flow 93 PROFIBUS*, *BA 076D/06/en*).	X		O
DIAGNOSIS (V6...)				
DIAGNOSIS (V6H0) *DIAGNOSIS (Byte 1), (0/29)*	Diagnosis information of the measuring device (first byte) with bit encoding. Several messages are possible. If manufacturer-specific information is available it is shown in the DIAGNOSIS_ EXT parameter.	X		M
DIAGNOSIS 1 (V6H1) *DIAGNOSIS (Byte 2), (0/29)*	Diagnosis information of the measuring device (second byte) with bit encoding. Several messages are possible. If manufacturer-specific information is available it 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), (0/29)*	Diagnosis information of the measuring device (fourth byte) with bit encoding. Several messages are possible. If manufacturer-specific information is available it 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_EXTENSION (0/30)*	Manufacturer-specific information with bit encoding. Several messages are possible.	X		O

Physical Block (device block)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
BLOCK MODE (V8...) 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 (0/21)*	For selecting the desired operating mode. Only the automatic mode can be selected in the Physical Block. **Options:** AUTO **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLOCK (Actual, Byte 1), (0/22)*	The current operating mode appears on the display. **Display:** AUTO	X		M
NORMAL (V8H2) *MODE_BLOCK (Normal, Byte 2), (0/22)*	The operating mode for normal operation appears on the display. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLOCK (Permitted, Byte 3), (0/22)*	The permissible operating modes appear on the display. **Display:** AUTO	X		M
ALARM CONFIG (V9...) The Active Block Alarm is supported which flags a change in a parameter with static parameters (Static attribute) for 10 seconds and indicates that a warning limit or an alarm limit has been violated in a function block.				
CURRENT (V9H0) *ALARM_SUM (CURRENT), (0/23)*	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUM (DISABLE), (0/23)*	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M
ST REVISION (V9H5) *ST_REV (0/17)*	A block has static parameters (Static attribute) that are not changed by the process. Static parameters whose values 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

Physical Block (device block)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
BLOCK PARAMETER (VA...)				
TAG (VAH0) *TAG_DESC (0/18)*	For entering a user-specific text of max. 32 characters for unique identification and assignment of the block. **Factory setting:** "_ _ _ _ _ _ _ _" no text	X	X	M
STRATEGY (VAH1) *STRATEGY (0/19)*	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 (0/20)*	For entering the identification number of the plant unit. This information can be used by the control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3) –	The profile version implemented in the device appears on the display. **Display:** 30 (3.0)	X		O

3 Transducer Blocks (transmission blocks)

The Transducer Blocks of Prosonic Flow 93 PROFIBUS contain all the measurement-related and device-specific parameters of the flowmeter. All the settings directly connected with the flow measurement/application are made here. They form the interface between sensor-specific measured value preprocessing and the function blocks required for automation.

A Transducer Block allows you to influence the input and output variables 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 schematically illustrates the internal structure of the Transducer Blocks of Prosonic Flow 93 PROFIBUS.

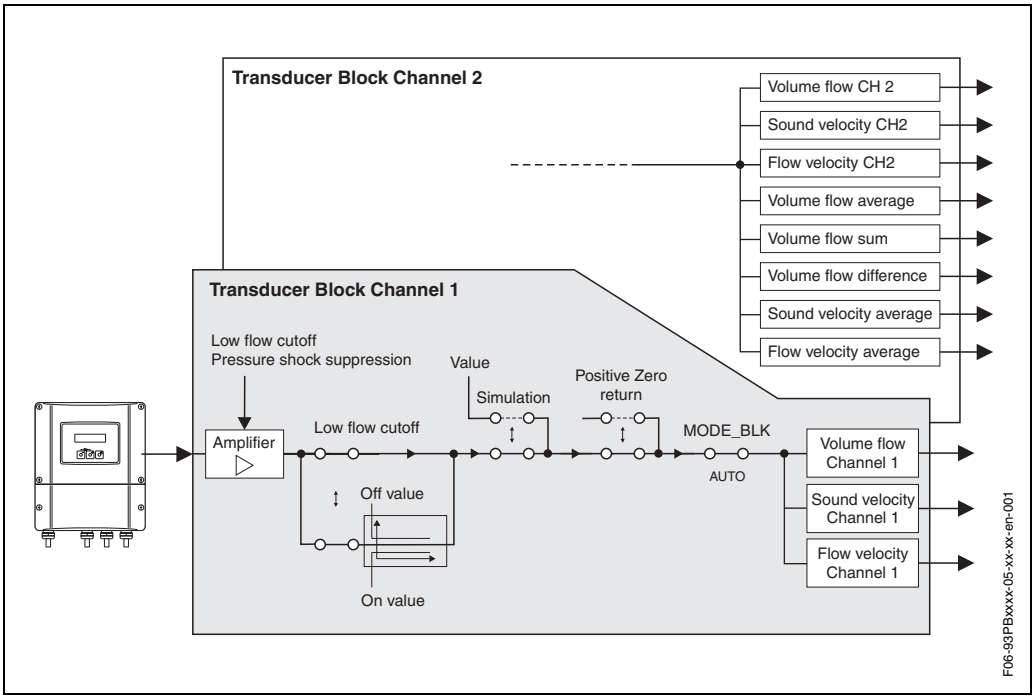


Fig. 2: Structure and function of the individual Transducer Blocks

3.1 Signal processing

The Transducer Blocks receive several signal variables from the sensor (volume flow, sound velocity) as the input variables. Other process variables are derived from these signal variables (e.g. average volume flow, volume flow sum, volume flow difference, average sound velocity, average flow velocity).
The input signals are prepared for measuring via the amplifier.

The VALUE SIMULATION MEASURAND parameter (see Page 138) allows you to specify a simulation value for the Transducer Block in order to test assigned parameters in the device and downstream function blocks.

A low flow cut off allows you to hide measurement inaccuracies in the low flow range. You can define a limit value by means of the ON-VALUE LOW FLOW CUT OFF parameter (see Page 97). If the measured flow value undershoots this limit value, the output value of 0 is output.

You also have the option of setting the measured value to “Zero Flow” by means of the POSITIVE ZERO RETURN parameter (see Page 108). This is necessary when the piping system is being cleaned, for example.

The process variables of the Transducer Block are output via various parameters illustrated in Fig. 2.

The most important functions and parameters of the Transducer Block are listed below. An overview of all the parameters available is provided from Page 92 onwards.

3.2 Block output variables

The Transducer Block has several process variables:

Transducer Block – Channel 1:
- Volume flow CH1
- Sound velocity CH1
- Flow velocity CH1

Transducer Block – Channel 2:
- Volume flow CH2
- Sound velocity CH2
- Flow velocity CH2
- Average volume flow
- Volume flow sum
- Volume flow difference
- Average sound velocity
- Average flow velocity

The CHANNEL parameter in the Analog Input function block (see Page 161) is used to assign which process variable is read in and processed in the downstream Analog Input function block:

CHANNEL = 273 (volume flow channel 1)
CHANNEL = 293 (sound velocity channel 1)
CHANNEL = 309 (flow velocity channel 1)
CHANNEL = 529 (volume flow channel 2)
CHANNEL = 549 (sound velocity channel 2)
CHANNEL = 565 (flow velocity channel 2)
CHANNEL = 567 (average volume flow)
CHANNEL = 570 (average sound velocity)
CHANNEL = 568 (volume flow sum)
CHANNEL = 569 (volume flow difference)
CHANNEL = 571 (average flow velocity)

3.3 Alarm detection and processing

The Transducer Block does not generate any process alarms. The status of the process variables of the Transducer Block is evaluated in the downstream Analog Input function blocks. If the Analog Input function block does not receive an input value that can be evaluated from the Transducer Block, then a process alarm is generated. This process alarm is displayed via the OUT_STATUS, OUT_SUB_STATUS and OUT_LIMIT parameters of the Analog Input function block (see Page 153).

The ACTUAL SYSTEM CONDITION parameter (see Page 136) of the Transducer Block displays the device error that produced the input value that could not be evaluated and thus triggered the process alarm in the Analog Input function block.
More information on rectifying errors can be found in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*.

3.4 Access to manufacturer-specific parameters

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

1. Hardware write protection must be disabled (see Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*).
2. The correct code must be entered in the ACCESS CODE parameter (see Page 96).

3.5 Parameters: Transducer Block “Device matrix”

The following table shows all the parameters available for the Transducer Block. The parameters can be changed by means of Class 2 master, such as Commuwin II or PDM (Process Device Management).
A grey ■ background indicates the manufacturer-specific parameters. Apart from the parameters in the “Using the profile parameters” parameter group (Page 142 onwards) no parameter of the Transducer Block can be changed unless the private code has first been entered.

Abbreviations used in the table:
- R = Read
- W = Write
- P = Parameter, with a distinction between:
  – M = Mandatory parameter
  – O = Optional parameter

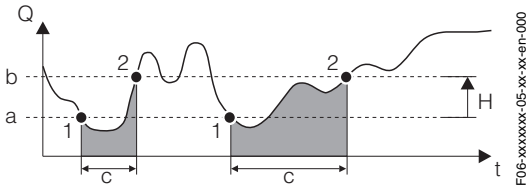
Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MEASURED VARIABLES (channel 1, channel 2), (V0...)				
VOLUME FLOW CHn (V0H0) *TB_VOLUME_FLOW (1/87)* *TB2_VOLUME_FLOW (2/87)*	The volume flow currently measured appears on the display (channel 1 or channel 2). **Display:** 5-digit floating-point number, including unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)	X		M
SOUND VELOCITY CHn (V0H1) *TB_SOUND_VELOCITY (1/107)* *TB2_SOUND_VELOCITY (2/107)*	The sound velocity currently measured in the liquid appears on the display (channel 1 or channel 2). **Display:** 5-digit fixed-point number, incl. units (e.g. 1400.0 m/s, 5249.3 ft/s)	X		M
FLOW VELOCITY CHn (V0H2) *TB_FLOW_VELOCITY (1/123)* *TB2_FLOW_VELOCITY (2/123)*	The flow velocity currently measured appears on the display (channel 1 or channel 2). **Display:** 5-digit floating-point number, including unit and sign (e.g. 8.0000 m/s, 26.247 ft/s)	X		O
SIGNAL STRENGTH CHn (V0H3) *TB_SIGNALSTRENGTH (1/124)* TB2_SIGNALSTRENGTH (2/124)	The signal strength appears on the display (channel 1). **Display:** 4-digit fixed-point number (e.g. 80.0) ✎ Note! To ensure reliable measurement takes place, Prosonic Flow requires a signal strength of > 30.	X		O

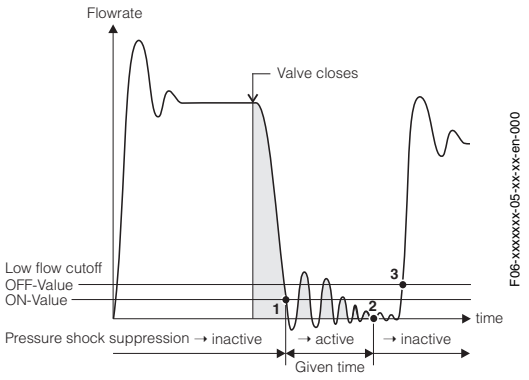
Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
VOLUME FLOW AVG. (V0H4) *TB2_VOLUME_FLOW_AVG (2/125)*	The average volume flow appears on the display. This is calculated from the measured values: (VOLUME FLOW CH1 + VOLUME FLOW CH2) · 1/2. **Display:** 5-digit floating-point number, incl. unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)	X		O
VOLUME FLOW SUM (V0H5) *TB2_VOLUME_FLOW_SUM (2/126)*	The total volume flow appears on the display. This is calculated from the measured values: VOLUME FLOW CH1 + VOLUME FLOW CH2. **Display:** 5-digit floating-point number, incl. unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)	X		O
VOLUME FLOW DIFFERENCE (V0H6) *TB2_VOLUME_FLOW_DIFF (2/127)*	The difference between the volume flows appears on the display. This is calculated from: VOLUME FLOW CH1 – VOLUME FLOW CH2 **Display:** 5-digit floating-point number, incl. unit and sign (e.g. 5.5445 dm^3/min; 1.4359 m^3/h; –731.63 gal/d; etc.)	X		O
SOUND VELOC. AVG. (V0H7) *TB2_SOUND_VELOCITY_AVG (2/128)*	The average sound velocity appears on the display. This is calculated from: (SOUND VELOCITY K1 + SOUND VELOCITY K2) · 1/2 **Display:** 5-digit fixed-point number, incl. units (e.g. 1400.0 m/s, 5249.3 ft/s)	X		O
FLOW VELOC. AVG. (V0H8) *TB2_FLOW_VELOCITY_AVG (2/129)*	The average flow velocity appears on the display. This is calculated from: (FLOW VELOC. CH1 + FLOW VELOC. CH2) · 1/2 **Display:** 5-digit floating-point number, incl. unit and sign (z. B. 8.0000 m/s, 26.247 ft/s)	X		O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SYSTEM UNITS (V1...)				
UNIT VOLUME FLOW (V1H0) *TB_VOLUME_FLOW_UNITS (1/88)* *TB2_VOLUME_FLOW_UNITS (2/88)*	Use this function to select the unit for displaying the volume flow. The unit you select here is also valid for: • Output PROFIBUS-DP/-PA • Low flow cut off **Options:** ✎ Note! The following units of time (...) can be selected: s = second, m = minute, h = hour, d = day *Metric:* Cubic centimetre → cm^3/... Cubic decimetre → dm^3/... Cubic metre → m^3/... Millilitre → ml/... Litre → l/... Hectolitre → hl/... Megalitre → Ml/... MEGA *US:* Cubic centimetre→ cc/... Acre foot → af/... Cubic foot → ft^3/... Fluid ounce → oz f/... Gallon → US gal/... Million gallon → US Mgal/... Barrel (normal fluids: 31.5 gal/bbl) → US bbl/... NORM. Barrel (beer: 31.0 gal/bbl) → US bbl/... BEER Barrel (petrochemicals: 42.0 gal/bbl) → US bbl/... PETR. Barrel (filling tanks: 55.0 gal/bbl) → US bbl/... TANK *Imperial:* Gallon → imp. gal/... Mega gallon → imp. Mgal/... Barrel (beer: 36.0 gal/bbl) → imp. bbl/... BEER Barrel (petrochemicals: 34.97 gal/bbl) → imp. bbl/... PETR. **Factory setting:** l/s	X	X	M
UNIT VELOCITY (V1H1) *TB_SOUND_VELOCITY_UNITS (1/108)* *TB2_SOUND_VELOCITY_UNITS (2/108)*	Use this function to select the unit for displaying the velocity. The unit you select here is valid for: • Sound velocity • Flow velocity **Options:** m/s ft/s **Factory setting:** m/s	X	X	M

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
UNIT VISCOSITY (V1H4) *TB_VISCOSITY_UNITS (1/108)* *TB2_VISCOSITY_UNITS (2/108)*	Use this function to select the unit for fluid viscosity. **Options:** mm2/s cSt St **Factory setting:** mm2/s	X	X	O
UNIT TEMPERATURE (V1H5) *TB_TEMP_UNITS (1/131)*	Use this function to select the unit for displaying the fluid temperature. ✎ Note! The liquid temperature is entered in the TEMPERATURE function (see Page 108). **Options:** °C (Celsius) K (Kelvin) °F (Fahrenheit) R (Rankine) **Factory setting:** °C	X	X	O
UNIT LENGTH (V1H6) *TB_NOMINAL_SIZE_UNITS (1/86)*	Use this function to select the unit for the measure of length. The unit you select here is valid for: • Nominal diameter • Diameter • Wall thickness • Liner thickness • Path length • Wire length • Sensor distance ... **Options:** mm inch **Factory setting:** mm	X	X	M

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
USER INTERFACE (V2...)				
ACCESS CODE (V2H0) *TB_LOCK_ACCESS_CODE (1/134)*	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 (factory setting = 93, 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 private code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *TB_LOCK_PRIVATE_CODE (1/135)*	Use this function to enter a private code for enabling programming. **User input:** 0...9999 (max. 4-digit number) **Factory setting:** 93 ✎ Note! • Programming is always enabled with the code “0”. • Programming has to be enabled before this code can be changed. When programming is disabled this parameter is not available; this precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *TB_LOCK_ACCESS_STATUS (1/136)*	Use this function to check the access status for the function matrix. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)	X		O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
LF/EPD PARAMETERS (V3...)				
ASSIGN LOW FLOW CUT OFF (V3H0) *TB_LOW_FLOW_CUTOFF_ASSIGN (1/151)* *TB2_LOW_FLOW_CUTOFF_ASSIGN (2/151)*	Use this function to assign a measured variable to the low flow cut off. **Options:** OFF VOLUME FLOW **Factory setting:** VOLUME FLOW	X	X	O
ON-VALUE LOW FLOW CUT OFF (V3H1) *TB_LOW_FLOW_CUTOFF (1/79)* *TB2_LOW_FLOW_CUTOFF (2/79)*	Use this function to specify the on-value 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, [unit] **Factory setting:** 0 l/s ✎ Note! The appropriate unit is taken from the SYSTEM UNITS function group (see Page 94).	X	X	M
OFF-VALUE LOW FLOW CUT OFF (V3H2) *TB_LOW_FLOW_CUTOFF_OFF_VALUE (1/152)* *TB2_LOW_FLOW_CUTOFF_OFF_VALUE (2/152)*	Use this function to specify the switch-off point for low flow cut off. Enter the switch-off point as a positive hysteresis (H) from the switch-on point. **User input:** 0...100% **Factory setting:** 50% Example:  Q = Flow [volume/time] t = Time a = On-value = 200 kg/h (V3H1) b = Off-value = 10% (V3H2) c = Low flow cut off active 1 = Low flow cut off is switched on at 200 kg/h 2 = Low flow cut off is switched off at 220 kg/h	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
PRESSURE SHOCK SUPPRESSION (V3H3) *TB_SYSTEM_PRESSURE_SHOCK_ SUPPRES (1/153)* *TB2_SYSTEM_PRESSURE_SHOCK_ SUPPRES (2/153)*	The closure of a valve can cause brief but severe movements of the liquid in the piping system, movements which the measuring system registers. The pulses totalled in this way result in a totalizer reading error, particularly in the case of batching processes. For this reason, the measuring device is equipped with pressure shock suppression (= short-term signal suppression) which can eliminate system-related “disruptions”. ✎ Note! Pressure shock suppression cannot be used unless the low flow cut off is active (see ON-VALUE LOW FLOW CUT OFF parameter). Use this function to define the time span for active pressure shock suppression. **Activation of the pressure shock suppression** Pressure shock suppression is activated after the flow undershoots the switch-on point of the low flow cut off (see point **1** in graphic). While pressure shock suppression is active, the following conditions apply: • Flow reading → 0. • Totalizer reading → The totalizers are pegged at the last valid value. **Deactivation of the pressure shock suppression** The pressure shock suppression is deactivated after the time interval, set in this function, has passed (see point **2** in graphic). ✎ Note! The current flow value is only processed and displayed again once the time interval for the pressure shock suppression has elapsed and the flow exceeds the off-value for low flow cut off (see point **3** in graphic).  **User input:** Max. 4-digit number, incl. unit: 0.00...100.0 s **Factory setting:** 0.00 s	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
PIPE DATA (V4...)				
PIPE STANDARD (V4H0) *TB_PIPE_STANDARD (1/155)* *TB2_PIPE_STANDARD (2/155)*	Use this function to select a pipe standard. **Options:** OTHER DIN: PN10, PN16, 28610, 28614, 28615, 28619 ANSI: SCHEDULE 40, SCHEDULE 80 AWWA: CLASS 50, CLASS 53, CLASS 55, ✎ Note! The selection specifies the values for the following functions: • PIPE MATERIAL • SOUND VELOCITY PIPE • LINER MATERIAL If you edit these parameters the pipe standard will be reset to the option OTHERS. **Factory setting:** DIN PN10	X	X	O
NOMINAL DIAMETER (V4H1) *TB_NOMINAL_DIAMETER (1/156)* *TB2_NOMINAL_DIAMETER (2/156)*	✎ Note! This parameter is not available if the option OTHER was selected in the parameter PIPE STANDARD (V4H0). Use this function to select the nominal diameter of the pipe. **Options:** OTHER DN: 25/1", 40/1½", 50/2", 80/3", 100/4", 150/6", 200/8", 250/10", 300/12", 400/16", 450/18", 500/20", 600/24", 700/28", 750/30", 800/32", 900/36", 1000/40", 1200/48", 1400/54", 1500/60", 1600/64", 1800/72", 2000/80" ✎ Note! The selection specifies the values for the following parameters: • PIPE CIRCUMFERENCE (V4H5) • PIPE DIAMETER (V4H6) • WALL THICKNESS (V4H7) If you edit these parameters the pipe standard will be reset to the option OTHERS and the parameter NOMINAL DIAMETER (V4H1) does not appear. **Factory setting:** 80/3"	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
PIPE MATERIAL (V4H2) *TB_PIPE_MATERIAL (1/157)* *TB2_PIPE_MATERIAL (2/157)*	This parameter displays the pipe material determined via the values entered in the parameter PIPE STANDARD (V4H0). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the parameter NOMINAL DIAMETER (V4H1) does not appear.. If a pipe standard was not available for selection and the selection OTHER was made in the parameter PIPE STANDARD (V4H0) the pipe material must be entered here. **Options:** CARBON STEEL, DUCTILE IRON, STAINLESS STEEL, SS ANSI 304, SS ANSI 316, SS ANSI 347, SS ANSI 410, SS ANSI 430, HASTELLOY C, PVC, PE, LDPE, HDPE, GRP, PVDF, PA, PP, PTFE, GLASS PYREX, ASBESTOS CEMENT, OTHER **Factory setting:** STAINLESS STEEL	X	X	O
REFERENCE VALUE (V4H3) *TB_REFERENCE_VALUE (1/158)* *TB2_REFERENCE_VALUE (2/158)*	Use this function to specify the thickness of the reference component (e.g. flange) as the basis for measuring the sound velocity of the pipes. ✎ Note! This function does not appear unless SOUND VELOCITY PIPE was selected in the MEASUREMENT function (CH1: V3H0 / CH2: V6H0) via the manufacturer-specific matrix “Sensor data”. **User input:** 5-digit floating-point number, [unit] **Factory setting:** 5 mm	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SOUND VELOCITY PIPE (V4H4) *TB_SOUND_VELOCITY_PIPE (1/159)* *TB2_SOUND_VELOCITY_PIPE (2/159)*	This parameter displays the sound velocity in the pipe determined via the values entered in the parameter PIPE STANDARD (V4H0). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the parameter NOMINAL DIAMETER (V4H1) does not appear. If a pipe standard was not available for selection and the selection OTHER was made in the parameter PIPE STANDARD (V4H0) the sound velocity must be entered here. **Measuring the sound velocity in the pipe:** If the sound velocity in the pipe is not known, it can be measured using the wall thickness measuring sensor DDU 19 (order option). Proceed as follows to do so: 1. Specifying the measured variable: In the partial matrix “Sensor data” (manufacturer-specific), open the parameter MEASUREMENT (V3H0 or V6H0, see Page 113) and select the SOUND VELOCITY PIPE setting. 2. Measuring: In the partial matrix “Device matrix CH1/CH2”, open the parameter SOUND VELOCITY LONGI function (V5H4). The sound velocity in the pipe is then measured automatically. The data recorded during this measuring process are constantly displayed. 3. Applying/changing the measured value (V5H5): You can now apply and save the final measured value (measured value display = stable) to the measuring system by means of “Yes + Enter”. The sound velocity value applied is displayed again (V5H6) and can be changed if necessary. ✎ Note! A reference value is used as a basis for measuring the sound velocity. This reference value can be edited (see Page 100). **User input:** Fixed-point number 800....6500 m/s **Factory setting:** 3120 m/s	X	X	O
PIPE CIRCUMFERENCE (V4H5) *TB_CIRCUMFERENCE (1/160)* *TB2_CIRCUMFERENCE (2/160)*	This parameter displays the outer circumference of the pipe determined via the values entered in the parameter NOMINAL DIAMETER (V4H1). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the parameter NOMINAL DIAMETER (V4H1) does not appear. If a nominal diameter was not available for selection and the selection OTHER was made in the parameter NOMINAL DIAMETER (V4H1) the outer circumference must be entered here. **User input:** Fixed-point number 31.4...15708.0 mm **Factory setting:** 279.3 mm	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
PIPE DIAMETER (V4H6) *TB_PIPE_DIAMETER (1/161)* *TB2_PIPE_DIAMETER (2/161)*	This parameter displays the outer diameter of the pipe determined via the values entered in the parameter NOMINAL DIAMETER (V4H1). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and the parameter NOMINAL DIAMETER (V4H1) does not appear. If a nominal diameter was not available for selection and the selection OTHER was made in theparameter NOMINAL DIAMETER (V4H1) the outer diameter must be entered here. **User input:** Fixed-point number 10.0...5000.0 mm **Factory setting:** 88.9 mm	X	X	O
WALL THICKNESS (V4H7) *TB_WALL_THICKNESS (1/162)* *TB2_WALL_THICKNESS (2/162)*	This parameter displays the thickness of the pipe wall determined via the values entered in the parameter NOMINAL DIAMETER (V4H1). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and theparameter NOMINAL DIAMETER (V4H1) does not appear. If a nominal diameter was not available for selection and the selection OTHER was made in the parameter NOMINAL DIAMETER (V4H1) the thickness of the pipe wall must be entered here. **Measuring the wall thickness** If the wall thickness of the pipe is not known, it can be measured using the wall thickness measuring sensor DDU 19 (order option). Proceed as follows to do so: 1. Specifying the measured variable: In the partial matrix “Sensor data” (manufacturer-specific), open the WALL THICKNESS/MEASUREMENT function (CH1: V3H0 / CH2: V6H0) and select the WALL THICKNESS setting. 2. Measuring: In the partial matrix “Device matrix CH1/CH2”, open the WALL THICKNESS function (V5H7). The wall thickness is then measured automatically. The data recorded during this measuring process are constantly displayed. 3. Applying/changing the measured value (V5H8): You can now apply and save the final measured value (measured value display = stable) to the measuring system by means of “Yes + Enter”. The wall thickness value applied is displayed again (V4H7) and can be changed if necessary. **User input:** Fixed-point number 0.1...100.0 mm **Factory setting:** 3.2 mm	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
LINER MATERIAL (V4H8) *TB_LINER_MATERIAL (1/163)* *TB2_LINER_MATERIAL (2/163)*	This parameter displays the liner material of the pipe determined via the values entered in the parameter PIPE STANDARD (V4H0). If you edit the predetermined value the pipe standard will be reset to the option OTHERS and theparameter PIPE STANDARD (V4H0) does not appear. If a pipe standard was not available for selection and the selection OTHER was made in parameter PIPE STANDARD (V4H0) the liner material must be entered here. **Options:** NO LINER MORTAR RUBBER TAR EPOXY OTHER **Factory setting:** NO LINER	X	X	O
ADJUST (V5...)				
ZERO POINT ADJUST (V5H0) *TB_ZERO_POINT_ADJUST (1/83)* *TB2_ZERO_POINT_ADJUST (2/83)*	Use this parameter to start zero point adjustment automatically. The new zero point determined by the measuring system is adopted by the ZERO POINT parameter. **Options:** CANCEL RUN **Factory setting:** CANCEL Caution! Before carrying this out, please refer to the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en* for a detailed description of the procedure for zero point adjustment. Note! • Programming is locked during zero point adjustment and the message “ZERO ADJUST RUNNING” appears on the local display. • If the zero point adjustment is not possible (e.g. if v > 0.1 m/s) or has been cancelled, the alarm “ZERO ADJUST NOT POSSIBLE” appears on the local display.	X	X	M

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SOUND VELOCITY LINER (V5H1) *TB_SOUND_VELOCITY_LINER (1/164)* *TB2_SOUND_VELOCITY_LINER (2/164)*	✎ Note! This parameter is not available if the option LINER NONE was selected in the parameter LINER MATERIAL (V4H8). This parameter displays the sound velocity liner determined via the values entered in the parameter LINER MATERIAL (V4H8). If you edit the predetermined value the liner material will be reset to the option OTHERS. If a liner material was not available for selection and the selection OTHER was made in the parameter LINER MATERIAL (V4H8) the sound velocity liner must be entered here. **User input:** Fixed-point number 800....6500 m/s **Factory setting:** Depends on the setting selected in the LINER MATERIAL function (V4H8)	X	X	O
LINER THICKNESS (V5H2) *TB_LINER_THICKNESS (1/165)* *TB2_LINER_THICKNESS (2/165)*	Use this function to enter the thickness of the liner. ✎ Note! This parameter is not available if the option LINER NONE was selected in the parameter LINER MATERIAL (V4H8). **User input:** Fixed-point number 0.1...100.0 mm **Factory setting:** 0 mm	X	X	O
PROFIBUS-DP/-PA (V6...)				
WRITE PROTECTION (V6H0) *PB_HW_WRITE_PROTECTION (0/41)*	Use this function to display the position of the jumper used to set general write protection. **Display:** OFF → Write protection disabled ON → Write protection enabled; functions cannot be changed via local operation or by means of the PROFIBUS protocol (Class 2 master). **Factory setting:** OFF ✎ Note! Write protection is disabled and enabled by means of a jumper on the I/O module (see Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*).	X		O

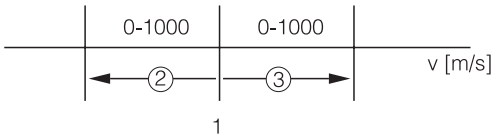
Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SELECTION GSD (V6H1) *PB_IDENT_NUMBER_SELECTOR (0/40)*	✎ Note! In the configuration phase, each PROFIBUS device must check an ID number allocated by the PNO (PROFIBUS user organisation). 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 function 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) *PB_SET_UNIT_TO_BUS (0/56)*	Use this parameter to transmit the preset system unit to the automation system. When transmission takes place, the OUT value in the Analog Input Block is automatically scaled to the set 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 *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*. **Option** CANCEL – YES (SET UNITS) **Factory setting:** CANCEL ☝ Caution! Activating this function can cause the OUT value to change suddenly; this, in turn, can affect subsequent control routines.	X	X	O
BLOCK SELECTION (V6H3) *TB_PROFIBUS_BLOCK_ SELECTION (1/143)*	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 ANALOG INPUT 2 ANALOG INPUT 3 ANALOG INPUT 4 ANALOG INPUT 5 ANALOG INPUT 6 ANALOG INPUT 7 ANALOG INPUT 8 **Factory setting:** ANALOG INPUT 1	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
OUT VALUE (V6H4) *TB_PROFIBUS_OUT_VALUE (1/144) (Byte 1...4)*	This parameter displays 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) *TB_PROFIBUS_OUT_VALUE (1/144) (Byte 5)*	Use this parameter to display the OUT (output) status in hexadecimal notation. The meanings of the individual status values are described in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*. ✎ Note! This parameter cannot be viewed on the local display.	X		O
DISPLAY VALUE (V6H6) *PB_LOCAL_DISPLAY_INPUT (0/57) (Byte 1...4)*	Use this parameter to transmit the value and status calculated by the automation system directly to Prosonic Flow 93. This is a display-only value: it cannot be processed by the system. ✎ Note! BAD is displayed as the status if no status information is sent to the device.	X		O
DISPLAY VALUE STATUS (V6H7) *PB_LOCAL_DISPLAY_INPUT (0/57) (Byte 5)*	Use this parameter to display the display value status in hexadecimal notation. The meanings of the individual status values are described in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*. ✎ Note! • BAD is displayed as the status if no status information is sent to the device. • This parameter cannot be viewed on the local display.	X		O
PROFIBUS INFO (V7...)				
BUS ADDRESS (V7H0) *PB_DEV_BUS_ADDR (0/54)*	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 via local operation.	X		O
PROFILE VERSION (V7H1) –	Use this parameter to view the profile version.	X		O
ACTUAL BAUDRATE (V7H2) *TB_PROFIBUS_ACTUAL_ BAUDRATE (1/145)*	Use this parameter to view the data transmission rate at which the device communicates, as set in the automation system.	X		O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
DEVICE ID (V7H3) *TB_PROFIBUS_DEVICE_ID (1/147)*	Use this parameter to view the manufacturer-specific device ID. **Display:** • PROFIBUS-DP = 1531 Hex • PROFIBUS-PA = 1530 Hex ✎ Note! If PROFILE GSD was selected in the SELECTION GSD (V6H1, see Page 105) parameter or in the SELECTION GSD function (6140), the PROFILE ID = 9741 Hex is displayed in this parameter.	X		O
CHECK CONFIGURATION (V7H4) *TB_PROFIBUS_CHECK_CONFIG (1/146)*	Use this parameter to check whether the configuration of a Class 1 master has been accepted for cyclic data exchange by Prosonic Flow 93. **Display:** ACCEPTED (configuration accepted) NOT ACCEPTED (configuration not accepted)	X		O
SYSTEM PARAMETERS (V8...)				
MEASURING MODE (V8H0) *TB_MEASUREMENT_ MODE (1/80)* *TB2_MEASUREMENT_MODE (2/80)*	Use this function to define the flow direction relevant to measurement for the signal output: Unidirectional: Signal output only with positive flow direction (forward). Flows with negative flow direction (reverse) are not taken into account or totalled by the measuring system. Bidirectional: Signal output with both flow directions (forward and reverse). **Options:** UNIDIRECTIONAL BIDIRECTIONAL **Factory setting:** UNIDIRECTIONAL	X	X	M
INSTALLATION DIRECTION SENSOR (V8H1) *TB_FLOW_DIRECTION (1/81)* *TB2_FLOW_DIRECTION (2/81)*	Use this parameter to reverse the sign of the flow rate variable, if necessary. **Options:** FORWARD REVERSE **Factory setting:** FORWARD	X	X	M

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
FLOW DAMPING (V8H2) *TB_SYSTEM_FLOW_DAMPING (1/174)* *TB2_SYSTEM_FLOW_DAMPING (2/174)*	✎ Note! The system damping acts on all functions and outputs of the measuring device. Use this function to set the filter depth of the digital filter. The sensitivity of the measurement signal can be reduced with respect to interference peaks (e.g. in the event of a high solids content, gas bubbles in the fluid etc.). The system reaction time increases with the filter setting. **User input:** 0...100 **Factory setting:** 0 s	X	X	O
POSITIVE ZERO RETURN (V8H3) *TB_SYSTEM_POSITIVE_ZERO_RETURN (1/175)* *TB2_SYSTEM_POSITIVE_ZERO_RETURN (2/175)*	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 functions and outputs of the measuring device. **Options:** OFF ON (Signal output is set to the “zero flow” value). **Factory setting:** OFF	X	X	O
LIQUID DATA (V9...)				
LIQUID (V9H0) *TB_LIQUID (1/167)* *TB2_LIQUID (2/167)*	Use this parameter to select the liquid in the pipe. **Options:** WATER, SEAWATER, DISTILLED WATER, AMMONIA, ALCOHOL, BENZENE, BROMIDE, ETHANOL, GLYCOL, KEROSENE, MILK, METHANOL, TOLUOL, LUBRICATING OIL, FUEL OIL, PETROL, OTHERS ✎ Note! The selection specifies the values for the sound velocity and viscosity. If OTHER is selected, these must be entered via the SOUND VELOCITY (V9H2) and VISCOSITY (V9H3) parameters. **Factory setting:** WATER	X	X	O
TEMPERATURE (V9H1) *TB_LIQUID_TEMPERATURE (1/168)* *TB2_LIQUID_TEMPERATURE (2/168)*	Use this function to enter the process temperature of the liquid. Via the sound velocity, the value influences the determination of the sensor distance. Enter the process temperature at normal operating conditions to achieve an optimum configuration of the measuring system. **User input:** Fixed-point number –273.15...726.85 °C (0...1000 K) **Factory setting:** 20 °C	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SOUND VELOCITY LIQUID (V9H2) *TB_LIQUID_SOUND_VELOCITY (1/169)* *TB2_LIQUID_SOUND_VELOCITY (2/169)*	This parameter displays the sound velocity of the liquid determined via the values entered in the parameters LIQUID (V9H0) and TEMPERATURE (V9H1). If you edit the predetermined value the parameter LIQUID (V9H0) will be reset to the option OTHERS. If a liquid was not available for selection and the selection OTHER was made in the parameter LIQUID (V9H0) the sound velocity must be entered here. **Measuring the sound velocity of the liquid** If the sound velocity in the liquid is not known, it can be measured. Proceed as follows to do so: 1. Specifying the measured variable: In the partial matrix “Sensor data” (manufacturer-specific), open the MEASUREMENT/SOUND VELOCITY LIQUID function (CH1: V3H0 / CH2: V6H0) and select the SOUND VELOCITY LIQUID setting. 2. Measuring: In the partial matrix “Device matrix CH1/CH2”, open the SOUND VELOCITY LONGI function (VAH2,). The sound velocity in the liquid is then measured automatically. The data recorded during the measuring process are constantly displayed. 3. Applying/changing the measured value (VAH3): You can now apply and save the final measured value (measured value display = stable) to the measuring system by means of “Yes + Enter”. The sound velocity value applied is displayed again (V9H2) and can be changed if necessary. ✎ Note! To measure the sound velocity, you require the ultrasonic sensors "DDU18" which you can order as an accessory from Endress+Hauser. (continued on next page)	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SOUND VELOCITY LIQUID (V9H2) *TB_LIQUID_SOUND_VELOCITY (1/169)* *TB2_LIQUID_SOUND_VELOCITY (2/169)* (continued)	**Transmitter search range:** The measuring device searches for the measuring signal within a defined sound velocity range. You specify the search range in the SOUND VELOCITY NEGATIVE (V9H4) and SOUND VELOCITY POSITIVE (V9H5) functions. An error message is displayed if the sound velocity of the liquid exceeds the search range. ✎ Note! We recommend you select a smaller search range by unfavourable signal conditions (signal strength < 50%).  1 1 = Sound velocity of the liquid 2 = Lower search range: is specified in the SOUND VELOCITY NEGATIVE (V9H4) parameter. 3 = Upper search range: is specified in the SOUND VELOCITY POSITIVE (V9H5) parameter. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 1487 m/s			
VISCOSITY (V9H3) *TB_LIQUID_VISCOSITY (1/170)* *TB2_LIQUID_VISCOSITY (2/170)*	This parameter displays the viscosity of the liquid. This is determined via the values entered in the parameters LIQUID (V9H0) and TEMPERATURE (V9H1).If you edit the predetermined value the parameter LIQUID (V9H0) will be reset to the option OTHERS. If the liquid is not available for selection in the parameter LIQUID (V9H0) and the OTHER option was selected the viscosity must be entered here. **User input:** Fixed-point number 0.0...5000.0 mm^2/s **Factory setting:** 1 mm^2/s	X	X	O
SOUND VELOCITY NEGATIVE (V9H4) *S_VEL_NEG. (V9H4)* *TB_S_VEL_NEG LIQUID (1/171)* *TB2_S_VEL_NEG LIQUID (2/171)*	Use this function to specify the lower search range for the sound velocity of the liquid. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 800 m/s	X	X	O
SOUND VELOCITY POSITIVE (V9H5) *S_VEL_POS. (V9H5)* *TB_S_VEL_POS LIQUID (1/172)* *TB2_S_VEL_POS LIQUID (2/172)*	Use this function to specify the upper search range for the sound velocity of the liquid. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 1800 m/s	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MEASURING POINT (VA...)				
TAG NAME (VAH0) *PB_TAG_DESC (0/18)*	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name via local operation or by means of a Class 2 master. **User input:** Max. 32-character text, permissible: A–Z, 0–9, +,–, punctuation marks **Factory setting:** "_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _" (no text)	X	X	M
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.			

3.6 Parameters: Transducer Block “Sensor data”

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
USER INTERFACE (V2...)				
ACCESS CODE (V2H0) *TB_LOCK_ACCESS_CODE (1/134)*	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 (factory setting = 93, 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 private code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *TB_LOCK_PRIVATE_CODE (1/135)*	Use this parameter to enter a private code for enabling programming. **User input:** 0...9999 (max. 4-digit number) **Factory setting:** 93 ✎ Note! • Programming is always enabled with the code “0”. • Programming has to be enabled before this code can be changed. When programming is disabled this parameter is not available; this precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *TB_LOCK_ACCESS_STATUS (1/136)*	Use this parameter to check the access status for the manufacturer-specific parameters. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)	X		O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SENSOR PARAMETER CHANNEL 1 (V3...) / CHANNEL 2 (V6...)				
MEASUREMENT (V3H0) / (V6H0) *TB_SENSOR_MEASUREMENT (1/177)* *TB2_SENSOR_MEASUREMENT (2/177)*	**Options:** OFF CLAMP ON INSERTION SOUND VELOCITY LIQUID PIPE SOUND VELOCITY WALL THICKNESS **Factory setting:** CLAMP ON (channel 1) OFF (channel 2)	X	X	O
SENSOR TYPE (V3H1) / (V6H1) *TB_SENSOR_TYPE (1/178)* *TB2_SENSOR_TYPE (2/178)*	✎ Note! This function is only available if OFF was not selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113). **Options:** W-CL-05F-L-B [1] W-CL-1F-L-B [1] W-CL-2F-L-B [1] P-CL-05F-L-B [1] P-CL-1F-L-B [1] P-CL-2F-L-B [1] P-CL-05F-M-B [1] P-CL-1F-M-B [1] P-CL-2F-M-B [1] U-CL-2F-L-A [1] W-IN-1F-L-B [2] P-CL-1S-L-B [3] P-CL-1S-M-B [3] P-CL-4W-L-B[4] [1] This option is not available unless CLAMP ON was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113). [2] This option is not available unless INSERTION was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113). [3] This option is not available unless SOUND VELOCITY LIQUID was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113). [4] This option is not available unless SOUND VELOCITY PIPE or WALL THICKNESS was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113). **Factory setting:** W-CL-2F-L-B	X	X	O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
SENSOR CONFIGURATION (V3H2) / (V6H2) *TB_SENSOR_CONFIG (1/179)* *TB2_SENSOR_CONFIG (2/179)*	Use this function to select the configuration for the ultrasonic sensors, e.g. the number of traverses (in the Clamp On version) or whether single-path or dual-path configuration is present (in the Insertion version). ✎ Note! This function is not available unless one of the following options was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113): • CLAMP ON • SOUND VELOCITY LIQUID • INSERTION **Options:** NO. TRAVERSE: 1 [1] NO. TRAVERSE: 2 [2] NO. TRAVERSE: 3 [1] NO. TRAVERSE: 4 [2] SINGLE PATH [3] DUAL PATH [3] **Factory setting:** NO. TRAVERSE: 2 ✎ Note! When using the U-Sensor it is always required to set this function to “NO. TRAVERSE: 2” [1] This option is not available unless CLAMP ON or SOUND VELOCITY LIQUID was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113). [2] This option is not available unless CLAMP ON was selected in the parameter MEASUREMENT MEASUREMENT (V3H0 or V6H0, see Page 113). [3] This option is not available unless INSERTION was selected in the parameter MEASUREMENT (V3H0 or V6H0, see Page 113).	X	X	O
CABLE LENGTH (V3H3) / (V6H3) *TB_SENSOR_CABLE_LENGTH (1/180)* *TB2_SENSOR_CABLE_LENGTH (2/180)*	Use this function to select the length of the sensor cable. **Options:** LENGTH 5m/15 feet LENGTH 10m/30 feet LENGTH 15m/45 feet LENGTH 30m/90 feet **Factory setting:** LENGTH 5m/15 feet	X	X	O
SENSOR DISTANCE (V3H4) / (V6H4) *TB_SENSOR_POSITION (1/181)* *TB2_SENSOR_POSITION (2/181)*	Use this function to view the position of both sensors on the rail. ✎ Note! This option is not available unless CLAMP ON is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113) and the number of traverses is 2 or 4 (see SENSOR CONFIGURATION function, V3H2 or V6H2, see Page 114). **Display:** 5-digit number combination	X		O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
WIRE LENGTH (V3H5) / (V6H5) *TB_SENSOR_WIRE_LENGTH (1/182)* *TB2_SENSOR_WIRE_LENGTH (2/182)*	The wire length for mounting the sensors at the correct distance apart appears on the display. ✎ Note! This option is not available unless CLAMP ON is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113) and the number of traverses is 1 or 3 (see SENSOR CONFIGURATION function, V3H2 or V6H2, see Page 114). **Display:** max. 5-digit number, including unit (e.g. 200 mm)	X	X	O
SENSOR DISTANCE (V3H6) / (V6H6) *TB_SENSOR_DISTANCE (1/183)* *TB2_SENSOR_DISTANCE (2/183)*	The distance between sensor 1 and sensor 2 appears on the display as a length measurement. **Display:** max. 5-digit number, including unit (e.g. 200 mm)	X	X	O
ARC LENGTH (V3H7) / (V6H7) *TB_SENSOR_ARC_LENGTH (1/184)* *TB2_SENSOR_ARC_LENGTH (2/184)*	The arc length on the pipe appears on the display. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113) and DUAL PATH was selected in the SENSOR CONFIGURATION function (V3H2 or V6H2, see Page 114). **Display:** max. 5-digit number, including unit (e.g. 200 mm)	X	X	O
PATH LENGTH (V3H8) / (V6H8) *TB_SENSOR_PATH_LENGTH (1/185)* *TB2_SENSOR_PATH_LENGTH (2/185)*	The path length appears on the display. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113). **Display:** max. 5-digit number, including unit (e.g. 200 mm)	X	X	O
CALIBRATION DATA CHANNEL 1 (V4...) CHANNEL 2 (V7...)				
P-FACTOR (V4H0) / (V7H0) *TB_SENSOR_P_FACTOR (1/186)* *TB2_SENSOR_P_FACTOR (2/186)*	This parameter displays the p-factor. The p-factor indicates the influence of the velocity distribution of the flow profile inside the pipe; it is dependent on the reynolds number. The p-factor varies in the range 0.75 .. 0.95. If the displayed value ranges 0.75 .. 0.94 the measurement will have a reduced linearity.	X	X	O
ZERO POINT (V4H1) / (V7H1) *TB_SENSOR_ZERO_POINT (1/187)* *TB2_SENSOR_ZERO_POINT (2/187)*	The current zero-point correction value for the sensor appears on the display. **Display:** Max. 5-digit number: –99999...+99999 **Factory setting:** Depends on calibration	X	X	O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
CORRECTION FACTOR (V4H3) / (V7H3) *TB_SENSOR_CORRECTION_ FACTOR (1/188)* *TB2_SENSOR_CORRECTION_ FACTOR (2/188)*	Use this function to enter a correction factor at the client's site. **User input:** 5-digit floating-point number **Factory setting:** 1.0000 (no correction)	X	X	O
DEVIATION SENSOR DISTANCE (V4H4) / (V7H4) *TB_SENSOR_DEV_SENSOR (1/189)* *TB2_SENSOR_DEV_SENSOR (2/189)*	Use this function to enter a deviation value for the sensor distance. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113). **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm	X	X	O
DEVIATION ARC LENGTH (V4H5) / (V7H5) *TB_SENSOR_DEV_ARC_LENGTH (1/190)* *TB2_SENSOR_DEV_ARC_LENGTH (2/190)*	Use this function to enter a deviation value for the arc length. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113) and DUAL PATH was selected in the SENSOR CONFIGURATION function (V3H2 or V6H2, see Page 114). **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm	X	X	O
DEVIATION PATH LENGTH (V4H6) / (V7H6) *TB_SENSOR_DEV_PATH_LENGTH (1/191)* *TB2_SENSOR_DEV_PATH_LENGTH (2/191)*	Use this function to enter a deviation value for the path length. ✎ Note! This function is not available unless INSERTION is set in the MEASUREMENT function (V3H0 or V6H0, see Page 113). **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm	X	X	O

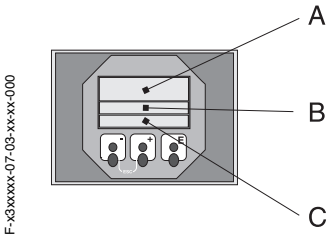
Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MEASURING POINT (VA...)				
TAG NAME (VAH0) *PB_TAG_DESC (0/18)*	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name via local operation or by means of a Class 2 master. **User input:** Max. 32-character text, permissible: A–Z, 0–9, +,–, punctuation marks **Factory setting:** "_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _" (no text)	X	X	M
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.			

3.7 Parameters: Transducer Block “Display functions”

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
USER INTERFACE (V2...)				
ACCESS CODE (V2H0) *TB_LOCK_ACCESS_CODE (1/134)*	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 (factory setting = 93, 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 private code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *TB_LOCK_PRIVATE_CODE (1/135)*	Use this parameter to enter a private code for enabling programming. **User input:** 0...9999 (max. 4-digit number) **Factory setting:** 83 ✎ Note! • Programming is always enabled with the code “0”. • Programming has to be enabled before this code can be changed. When programming is disabled this parameter is not available; this precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *TB_LOCK_ACCESS_STATUS (1/136)*	Use this parameter to check the access status for the manufacturer-specific parameters. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)	X		O

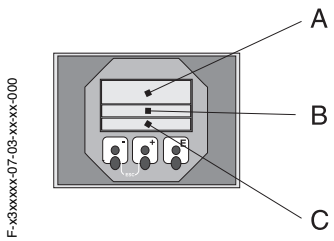
Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
DISPLAY FUNCTIONS (V3...)				
LANGUAGE (V3H0) *PB_HMI_LANGUAGE (0/78)*	Use this parameter to select the language for all texts and parameters shown on the local display. **Options:** ENGLISH – DEUTSCH – FRANCAIS – ESPANOL – ITALIANO – NEDERLANDS – DANSK – NORSK – SVENSKA – SUOMI – BAHASA INDONESIA – JAPANESE (syllabary) **Factory setting:** – ENGLISH: Australia, England, Hong Kong, India, Instruments International, Malaysia, Singapore, South Africa, Thailand, Hungary – DEUTSCH: Germany, Austria, Switzerland – FRANCAIS: France – ESPANOL: Spain – ITALIANO: Italy – NEDERLANDS: The Netherlands – DANSK: Denmark – NORSK: Norway – SVENSKA: Sweden – SUOMI: Finland – BAHASA INDONESIA: Indonesia – JAPANESE: Japan	X	X	O
DISPLAY DAMPING (V3H1) *PB_HMI_DAMPING (0/79)*	Use this parameter to enter a time constant defining how the local 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) *PB_HMI_LCD_CONTRAST (0/80)*	Use this parameter to optimise the 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**
X-LINE CALCULATED MAIN VALUES (V3H3) *PB_HMI_XLINE_CALC_M_VAL (0/134)*	Use this function to specify which “calculated main value” from the measured values of both channels is displayed. The option CALCULATED VOLUME FLOW must be selected in the ASSIGN function (V4H0 - main line; V6H0 - additional line; V8H0 - information line) so that the value appears in the line required. ✎ Note! This function does **not** appear if OFF was selected on at least one channel in the MEASUREMENT function (V3H0 or V6H0, see Page 113). **Options:** (CH1 + CH2) · 1/2 CH1 + CH2 CH1 – CH2 **Factory setting:** (CH1 + CH2) · 1/2	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MAIN LINE (V4...)				
	 A = main line, B = additional line, C = information line			
ASSIGN (V4H0) *PB_HMI_MAIN_L_ASSIGN (0/104)*	Use this parameter to define the display value assigned to the main line (the top line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOC. AVG. SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** VOLUME FLOW CH1 ✎ Note! If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT function (V3H0 or V6H0, see Page 113).	X	X	O
100% VALUE (V4H1) *PB_HMI_MAIN_L_100_VALUE (0/105)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V4H0) parameter: • VOLUME FLOW IN % • CORRECTED 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	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
FORMAT (V4H2) *PB_HMI_MAIN_L_FORMAT (0/106)*	Define the maximum number of places after the decimal point for the value displayed 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
MULTIPLEX (V5...)				
ASSIGN (V5H0) *PB_HMI_MAIN_L_MUX_ASSIGN (0/115)*	Use this parameter to define the display value assigned to the main line (the top line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOC. AVG. SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** VOLUME FLOW CH1 ✎ Note! If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT function (V3H0 or V6H0, see Page 113).	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
100% VALUE (V5H1) *PB_HMI_MAIN_L_MUX_100_VALUE (0/116)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V4H0) parameter: • VOLUME FLOW % (CH1...CH2) • CALCULATED 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	X	X	O
FORMAT (V5H2) *PB_HMI_MAIN_L_MUX_FORMAT (0/117)*	Define the maximum number of places after the decimal point for the value displayed 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...)				
	 A = main line, B = additional line, C = information line			
ASSIGN (V6H0) *PB_HMI_ADD_L_ASSIGN (0/118)*	Use this parameter to define the display value assigned to the additional line (the middle line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOC. AVG. SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** TOTALIZER ✎ Note! If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT function (V3H0 or V6H0, see Page 113) of the “Sensor data” matrix).	X	X	O

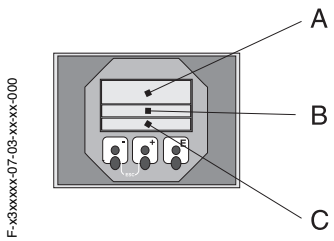
Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
100% VALUE (V6H1) *PB_HMI_ADD_L_100_VALUE (0/119)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V6H0) parameter: • VOLUME FLOW % (CH1...CH2) • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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	X	X	O
FORMAT (V6H2) *PB_HMI_ADD_L_FORMAT (0/120)*	Use this parameter to define the maximum number of places after the decimal point for the value displayed in the additional 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/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**
DISPLAY MODE (V6H3) *PB_HMI_ADD_L_DISP_MODE (0/121)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V6H0) parameter: • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW BARGRAPH % Use this parameter to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MULTIPLEX (V7...)				
ASSIGN (V7H0) *PB_HMI_ADD_L_MUX_ASSIGN (0/122)*	Use this parameter to define the second reading to be displayed in the additional line alternately (every 10 seconds) with the value defined in the ASSIGN LINE 2 (V6H0) parameter. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOC. AVG. SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** OFF ✎ Note! • Multiplex mode is suspended as soon as a fault/notice message is generated. • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the parameter MEASUREMENT (V3H0/V6H0, see Page 113). • If PROFILE GSD was selected in the parameter SELECTION GSD (V6H1, see Page 105), the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
100% VALUE (V7H1) *PB_HMI_ADD_L_MUX_100_VALUE (0/123)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V7H0) parameter: • VOLUME FLOW % (CH1...CH2) • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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	X	X	O
FORMAT (V7H2) *PB_HMI_ADD_L_MUX_FORMAT (0/124)*	Use this parameter to define the maximum number of places after the decimal point displayed for the second reading in the additional 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/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**
DISPLAY MODE (V7H3) *PB_HMI_ADD_L_MUX_DISP_MODE (0/125)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V7H0) parameter: • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW BARGRAPH % Use this parameter to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
INFORMATION LINE (V8...)				
	 A = main line, B = additional line, C = information line			
ASSIGN (V8H0) *PB_HMI_INFO_L_ASSIGN (0/126)*	Use this parameter to define the display value assigned to the information line (the bottom line of the local display) which should be displayed during normal operation. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOC. AVG. SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** OPERATING/SYSTEM CONDITION ✎ Note! If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the MEASUREMENT function (V3H0 or V6H0).	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
100% VALUE (V8H1) *PB_HMI_INFO_L_100_VALUE (0/127)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V8H0) parameter: • VOLUME FLOW % (CH1...CH2) • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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	X	X	O
FORMAT (V8H2) *PB_HMI_INFO_L_FORMAT (0/128)*	Use this parameter to define the maximum number of places after the decimal point for the value displayed in the information 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/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**
DISPLAY MODE (V8H3) *PB_HMI_INFO_L_DISP_MODE (0/129)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V8H0) parameter: • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW BARGRAPH % Use this parameter to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MULTIPLEX (V9...)				
ASSIGN (V9H0) *PB_HMI_INFO_L_MUX_ASSIGN (0/130)*	Use this parameter to define the second reading to be displayed in the information line alternately (every 10 seconds) with the value defined in the ASSIGN LINE 3 (V8H0) parameter. **Options:** OFF VOLUME FLOW (CH1...CH2) CALCULATED VOLUME FLOW VOLUME FLOW % (CH1...CH2) CALCULATED VOLUME FLOW IN % SOUND VELOCITY (CH1...CH2) SOUND VELOC. AVG. SIGNAL STRENGTH (CH1...CH2) FLOW VELOCITY (CH1...CH2) FLOW VELOCITY AVERAGE VOLUME FLOW BARGRAPH IN % (CH1...CH2) CALCULATED VOLUME FLOW BARGRAPH % SIGNAL STRENGTH BARGRAPH % (CH1...CH2) TAG NAME FLOW DIRECTION (CH1...CH2) CALCULATED FLOW DIRECTION AI1...AI8 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1...3 **Factory setting:** OFF ✎ Note! • Multiplex mode is suspended as soon as a fault/notice message is generated. • If a channel is not visible, it does not appear in the options. Channels can be displayed or hidden by means of the parameter MEASUREMENT (V3H0/V6H0, see Page 113). • If PROFILE GSD was selected in the parameter SELECTION GSD (V6H1, see Page 105), the following options are not available in this function: AI 3 to AI 8 - OUT VALUE, AO - DISP. VALUE, TOT 2 and TOT 3 - OUT VALUE	X	X	O
100% VALUE (V9H1) *PB_HMI_INFO_L_MUX_100_VALUE (0/131)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V9H0) parameter: • VOLUME FLOW IN % • VOLUME FLOW BARGRAPH IN % • CALCULATED VOLUME FLOW IN % • CALCULATED VOLUME FLOW BARGRAPH % 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	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
FORMAT (V9H2) *PB_HMI_INFO_L_MUX_FORMAT (0/132)*	Use this parameter to define the maximum number of places after the decimal point for the second value displayed in the information 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 such instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.	X	X	O
DISPLAY MODE (V9H3) *PB_HMI_INFO_L_MUX_DISP_MODE (0/133)*	✎ Note! This parameter is not available unless one of the following options was selected in the ASSIGN (V9H0) parameter: • VOLUME FLOW BARGRAPH IN % (CH1...CH2) • CALCULATED VOLUME FLOW BARGRAPH % Use this parameter to define the format of the bar graph. **Options:** STANDARD (Simple bar graph with 25 / 50 / 75% gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-000 SYMMETRY (symmetrical bar graph for positive and negative directions of flow, with –50 / 0 / +50 % gradations and integrated sign).  F-x3xxxxx-20-xx-xx-xx-001 **Factory setting:** STANDARD	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
MEASURING POINT (VA...)				
TAG NAME (VAH0) *PB_TAG_DESC (0/18)*	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name via local operation or by means of a Class 2 master. **User input:** Max. 32-character text, permissible: A–Z, 0–9, +,–, punctuation marks **Factory setting:** "_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _" (no text)	X	X	M
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.			

3.8 Parameters: Transducer Block “Version info”

Transducer Block (version info)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
DIAGNOSIS / ALARM (V0...)				
ACTUAL SYSTEM CONDITION (V0H0) *PB_ACTUAL_ERROR_CODE (0/49)*	Use this parameter to check the current system condition. **Display:** “SYSTEM OK” or the fault/notice message with the highest priority. ✎ Note! The explanations, causes and troubleshooting routines are provided in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*.	X		O
PREVIOUS SYSTEM CONDITIONS (V0H1) *PB_PREV_SYS_COND (0/84)*	For viewing the 15 most recent fault and notice messages since measuring last started. **Display:** 15 most recent fault or notice messages.	X		O
SYSTEM RESET (V0H2) *TB_SYSTEM_RESET (1/206)*	Use this parameter to reset the measuring system. **Options:** NO RESET RESTART SYSTEM (restart without interrupting power supply) **Factory setting:** NO RESET	X	X	O
ALARM DELAY (V0H3) *TB_DIAG_ALARM_DELAY (1/205)*	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 also acts on the local display. **User input:** 0...100 s (in steps of one second) **Factory setting:** 0 s	X	X	O
TROUBLESHOOTING (V0H4) *PB_TROUBLESHOOTING (0/88)*	Use this function to rectify faults in the EEPROM. The EEPROM is divided into a number of blocks. Only blocks in which an error has occurred are shown. To rectify the fault, select the block in question and press the Enter key to acknowledge the fault. ☝ Caution! When you clear an error in a block, the parameters of the block you select are reset to their factory settings. **Options:** CANCEL “Faulty Block“	X	X	O

Transducer Block (version info)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
USER INTERFACE (V2...)				
ACCESS CODE (V2H0) *TB_LOCK_ACCESS_CODE (1/134)*	All data of the measuring system are protected against inadvertent change. Programming is disabled and the device settings cannot be changed until a code is entered in this parameter. You can enable programing by entering your private code (factory setting = 93, 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 private code). • The Endress+Hauser service organisation can be of assistance if you mislay your personal code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *TB_LOCK_PRIVATE_CODE (1/135)*	Use this parameter to enter a private code for enabling programming. **User input:** 0...9999 (max. 4-digit number) **Factory setting:** 93 ✎ Note! • Programming is always enabled with the code “0”. • Programming has to be enabled before this code can be changed. When programming is disabled this parameter is not available; this precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *TB_LOCK_ACCESS_STATUS (1/136)*	Use this parameter to check the access status for the manufacturer-specific parameters. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)	X		O

Transducer Block (version info)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
SIMULATION CHANNEL 1 (V4...)				
SIMULATION MEASURAND (V4H0) *TB_SIM_MEASURAND (1/208)*	Use this parameter to simulate the output of the Transducer Block as a way of testing response. During this time, the words “SIMULATION MEASURED VARIABLE” appear on the local display. Simulation affects all AI (Analog Input) Blocks and TOT 1–3 (totalizer 1–3) Blocks. **Options:** OFF VOLUME FLOW (CH1...CH2) SOUND VELOCITY (CH1...CH2) **Factory setting:** OFF ✎ Note! If you also want to scale the unit of the simulated measured value, you can use the SET_UNIT_TO_BUS parameter (see Page 105) to transmit the selected system unit, which then has a direct relationship to measured-value scaling, to the automation system. This is also possible in the TOT 1–3 (totalizer 1–3) Blocks via the UNIT_TOT parameter (see Page 169). In the AI (Analog Input) Blocks you can use the OUT_UNIT parameter (see Page 155) 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 SIMULATION MEASURAND (V4H1) *TB_SIM_VALUE (1/209)*	✎ Note! This parameter is not displayed unless the SIMULATION MEASURAND parameter is active. Use this parameter to define a selectable value (e.g. 12 m^3/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 (version info)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
SIMULATION FAILSAFE MODE (V4H2) *TB_SIM_FSAFE_MODE (1/210)*	Use this parameter to simulate the error response of the Transducer Block. **Options:** OFF ON **Factory setting:** OFF ✎ Note! The error response of the function blocks must be defined in the appropriate AI (Analog Input) or TOT (totalizer) (see the function description of the function block in question).	X	X	O
SIMULATION CHANNEL 2 (V5...)				
SIMULATION MEASURAND (V5H0) *TB2_SIM_MEASURAND (2/208)*	Use this parameter to simulate the output of the Transducer Block as a way of testing response. During this time, the words “SIMULATION MEASURED VARIABLE” appear on the local display. Simulation affects all AI (Analog Input) Blocks and TOT 1–3 (totalizer 1–3) Blocks. **Options:** OFF VOLUME FLOW (CH1...CH2) SOUND VELOCITY (CH1...CH2) **Factory setting:** OFF ✎ Note! If you also want to scale the unit of the simulated measured value, you can use the SET_UNIT_TO_BUS parameter (see Page 105) to transmit the selected system unit, which then has a direct relationship to measured-value scaling, to the automation system. This is also possible in the TOT 1–3 (totalizer 1–3) Blocks via the UNIT_TOT parameter (see Page 169). In the AI (Analog Input) Blocks you can use the OUT_UNIT parameter (see Page 155) 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

Transducer Block (version info)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
VALUE SIMULATION MEASURAND (V5H1) *TB2_SIM_VALUE (2/209)*	✎ Note! This parameter is not displayed unless the SIMULATION MEASURAND parameter is active. Use this parameter to define a selectable value (e.g. 12 m^3/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		O
SENSOR / F-CHIP (V6...)				
SERIAL NUMBER (V6H0) *PB_SERIAL_NUM (0/60)*	The serial number of the sensor appears on the display.	X		O
STATUS F-CHIP –	✎ Note! This function is not available at this time. Use this function to check whether an F-Chip is installed and which software options are available.			
SOFTWARE REVISION NUMBER F-CHIP –	✎ Note! This function is not available at this time. The software revision number of the F-Chip appears on the display.			
AMPLIFIER INFO (V7...)				
SW REVISION NUMBER AMPLIFIER (V7H2) *PB_SW_REV_AMP (0/68)*	The software revision number of the amplifier appears on the display.	X		O
SW REVISION NUMBER T-DAT (V7H5) *PB_SW_REV_T_DAT (0/77)*	The software revision number of the software used to create the content of the T-DAT appears on the display.	X		O
I/O MODULE INFO (V8...)				
I/O MODULE TYPE (V8H0) *PB_IO_TYPE (0/71)*	The configuration of the I/O module appears on the display.	X		O
SW REVISION NUMBER I/O MODULE (V8H3) *PB_SW_REV_IO (0/74)*	The software revision number of the I/O module appears on the display.	X		O

Transducer Block (version info)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
MEASURING POINT (VA...)				
TAG NAME (VAH0) *PB_TAG_DESC (0/18)*	Use this parameter to assign a tag name to the measuring device. You can edit and read this tag name via local operation or by means of a Class 2 master. **User input:** Max. 32-character text, permissible: A–Z, 0–9, +,–, punctuation marks **Factory setting:** "_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _" (no text)	X	X	M
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.			

3.9 Parameters: Transducer Block "Profile parameters CH1/CH2"

Transducer Block (Using the profile parameters, channel 1 + 2)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
VOLUME FLOW (V0...)				
VOLUME FLOW (V0H0) *TB_VOLUMEN_FLOW (1/87)* *TB2_VOLUMEN_FLOW (1/87)* *(Byte 1...4)*	Use this parameter to display the current measured value of the first process variable (volume flow = factory setting) made available to the Analog Input Block 1 as an input variable. This process variable can be changed via the CHANNEL parameter. **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) *TB_VOLUMEN_FLOW (1/87)* *TB2_VOLUMEN_FLOW (1/87)* *(Byte 5)*	Use this parameter to display the current status of the first process variable (volume flow) made available to the Analog Input Block 1 as an input variable.	X		M
UNIT (V0H2) *TB_VOLUMEN_FLOW_ UNITS (1/88)* *TB2_VOLUMEN_FLOW_ UNITS (2/88)*	Use this parameter to select the displayed 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 VAL. (V0H3) *TB_VOLUME_FLOW_LO_LIMIT (1/89)* *TB2_VOLUME_FLOW_LO_LIMIT (2/89)*	Use this parameter to enter the measuring device's lower range value for volume flow.	X	X	M
UPPER RANGE VAL. (V0H4) *TB_VOLUME_FLOW_HI_ LIMIT (1/90)* *TB2_VOLUME_FLOW_HI_ LIMIT (2/90)*	Use this parameter to enter the measuring device's upper range value for volume flow.	X	X	M
ULTRASONIC (V4...)				
SOUND VELOCITY (V4H0) *TB_SOUND VELOCITY (1/107)* *TB2_SOUND VELOCITY (2/107)* *(Byte 1...4)*	Use this parameter to display the current measured value of the fourth process variable (sound velocity, factory setting) made available to the Analog Input Block 4 as an input variable. This process variable can be changed using the CHANNEL parameter. **Display:** 5-digit fixed-point number, incl. units (e.g. 1400.0 m/s, 5249.3 ft/s)	X		M

Transducer Block (Using the profile parameters, channel 1 + 2)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
STATUS (V4H1) *TB_SOUND VELOCITY (1/107)* *TB2_SOUND VELOCITY (2/107)* *(Byte 5)*	Use this parameter to display the current status of the fourth process variable (sound velocity) made available to the Analog Input Block 4 as an input variable.	X		M
UNIT (V4H2) *TB_SOUND_VELOCITY_UNITS (1/108)* *TB2_SOUND_VELOCITY_UNITS (2/108)*	Use this parameter to select the displayed unit for the sound velocity. **Options:** m/s ft/s **Factory setting:** m/s ✎ Note! Only the units defined in the 3.0 Profiles are available.	X	X	M
LOWER RANGE VAL. (V4H3) *TB_SOUND_VELOCITY_LO_LIMIT (1/109)* *TB2_SOUND_VELOCITY_LO_LIMIT (2/109)*	Use this parameter to enter the measuring device's lower range value for sound velocity.	X	X	M
UPPER RANGE VAL. (V4H4) *TB_SOUND_VELOCITY_HI_LIMIT (1/110)* *TB2_SOUND_VELOCITY_HI_LIMIT (2/110)*	Use this parameter to enter the measuring device's upper range value for sound velocity.	X	X	M
SYSTEM PARAMETER (V7...)				
MEASUREMENT MODE (V7H0) *TB_MEASUREMENT_ MODE (1/80)* *TB2_MEASUREMENT_ MODE (2/80)*	Use this parameter to set the flow mode as bidirectional or unidirectional. **Options:** UNIDIRECTIONAL BIDIRECTIONAL **Factory setting:** BIDIRECTIONAL	X	X	M
FLOW DIRECTION (V7H1) *TB_FLOW_DIRECTION (1/81)* *TB2_FLOW_DIRECTION (2/81)*	Use this parameter to set the sign of the flow rate variable. **Options:** POSITIVE NEGATIVE **Factory setting:** POSITIVE	X	X	M
LOW FLOW CUT OFF (V7H2) *TB_LOW_FLOW_CUTOFF (1/79)* *TB2_LOW_FLOW_CUTOFF (2/79)*	Use this function to enter the on-value for low flow cut off. **Factory setting:** 0.000	X	X	M

Transducer Block (Using the profile parameters, channel 1 + 2)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
ZERO POINT (V7H3) *TB_ZERO_POINT (1/82)* *TB2_ZERO_POINT (2/82)*	The current zero-point correction value for the sensors appears on the display. The zero-point correction factor is calculated and set at the factory. **Factory setting:** Depends on calibration	X	X	M
ZERO POINT ADJUSTMENT (V7H4) *TB_ZERO_POINT_ADJUST (1/83)* *TB2_ZERO_POINT_ADJUST (2/83)*	Use this function to start zero point adjustment automatically. The new zero point determined by the measuring system is adopted by the ZERO POINT function. **Options:** CANCEL EXECUTE **Factory setting:** CANCEL	X	X	M
ZERO POINT UNIT (V7H5) *TB_ZERO_POINT_UNIT (1/84)* *TB2_ZERO_POINT_UNIT (2/84)*	Use this parameter to enter the unit for the zero point. **Options:** mm/s **Factory setting:** mm/s	X	X	M
CALIBRATION FACTOR (V7H6) *TB_CALIBR_FACTOR (1/78)* *TB2_CALIBR_FACTOR (2/78)*	Use this parameter to enter the calibration factor. **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) *TB_NOMINAL_SIZE (1/85)* *TB2_NOMINAL_SIZE (2/85)*	Use this parameter to enter the nominal diameter of the sensor. **User input:** 2 ...2000 mm or 1/12 ...78“ **Factory setting:** Depends on the size of the sensor	X	X	M
NOMINAL SIZE UNIT (V7H8) *TB_NOMINAL_SIZE_UNITS (1/86)* *TB2_NOMINAL_SIZE_UNITS (2/86)*	Use this parameter to select the unit of the nominal diameter. **Options:** mm inch **Factory setting:** mm	X	X	M

Transducer Block (Using the profile parameters, channel 1 + 2)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
BLOCK MODE (V8...) 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) *TB_TARGET_MODE (1/75)* *TB2_TARGET_MODE (2/75)*	For selecting the desired operating mode. Only the automatic mode can be selected in the Transducer Block. **Options:** AUTO **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *TB_MODE_BLK (Byte 1), (1/76)* *TB2_MODE_BLK (Byte 1), (2/76)*	The current operating mode appears on the display. **Display:** AUTO	X		M
NORMAL (V8H2) *TB_MODE_BLK (Byte 3), (1/76)* *TB2_MODE_BLK (Byte 3), (2/76)*	The operating mode for normal operation appears on the display. **Display:** AUTO	X		M
PERMITTED (V8H3) *TB_MODE_BLK (Byte 2), (1/76)* *TB2_MODE_BLK (Byte 2), (2/76)*	The permissible operating modes appear on the display. **Display:** AUTO	X		M
UNIT MODE (V8H7) –	Use this parameter to select the form in which you want the units displayed. **Options:** list number In the **list** mode the units are displayed with the conventional abbreviations (e.g. l/s). In the **number** mode the units are displayed in the numerical code defined in the 3.0 Profiles, e.g. 1351 (l/s). **Factory setting:** list	X	X	O

Transducer Block (Using the profile parameters, channel 1 + 2)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
ALARM CONFIG (V9...) The Active Block Alarm is supported which flags a change in a parameter with static parameters (Static attribute) for 10 seconds and indicates that a warning limit or an alarm limit has been violated in the Analog Input function block.				
CURRENT (V9H0) *TB_ALARM_SUM (CURRENT), (1/77)* *TB2_ALARM_SUM (CURRENT), (2/77)*	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1) *TB_ALARM_SUM (DISABLE), (1/77)* *TB2_ALARM_SUM (DISABLE), (2/77)*	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M
UNACKOWLEDGED (V9H2) *TB_ALARM_SUM (UNACKNOWLEDGED), (1/77)* *TB2_ALARM_SUM (UNACKNOWLEDGED), (2/77)*	✎ Note! This parameter is not available in this profile version.			
UNREPORTED (V9H3) *TB_ALARM_SUM (UNREPORTED), (1/77)* *TB2_ALARM_SUM (UNREPORTED), (2/77)*	✎ Note! This parameter is not available in this profile version.			
ST REVISION (V9H5) *TB_ST_REV (1/71)* *TB2_ST_REV (2/71)*	A block has static parameters (Static attribute) that are not changed by the process. Static parameters whose values change during optimisation or configuration and 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) *TB_TAG_DESC (1/72)* *TB2_TAG_DESC (2/72)*	For entering a user-specific text of max. 32 characters for unique identification and assignment of the block. **Factory setting:** "_ _ _ _ _ _ _ _" no text	X	X	M
STRATEGY (VAH1) *TB_STRATEGY (1/73)* *TB2_STRATEGY (2/73)*	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 (Using the profile parameters, channel 1 + 2)				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
ALERT KEY (VAH2) *TB_ALERT_KEY (1/74)* *TB2_ALERT_KEY (2/74)*	For entering the identification number of the plant unit. This information can be used by the control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3) –	The profile version implemented in the device appears on the display. **Display:** 30	X		O

4 Analog Input Function Block

In the Analog Input function block, the process variables from the Transducer Block are prepared for the subsequent automation functions (e.g. scaling and limit value processing). Prosonic Flow 93 PROFIBUS has six Analog Input function blocks.

4.1 Signal processing

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

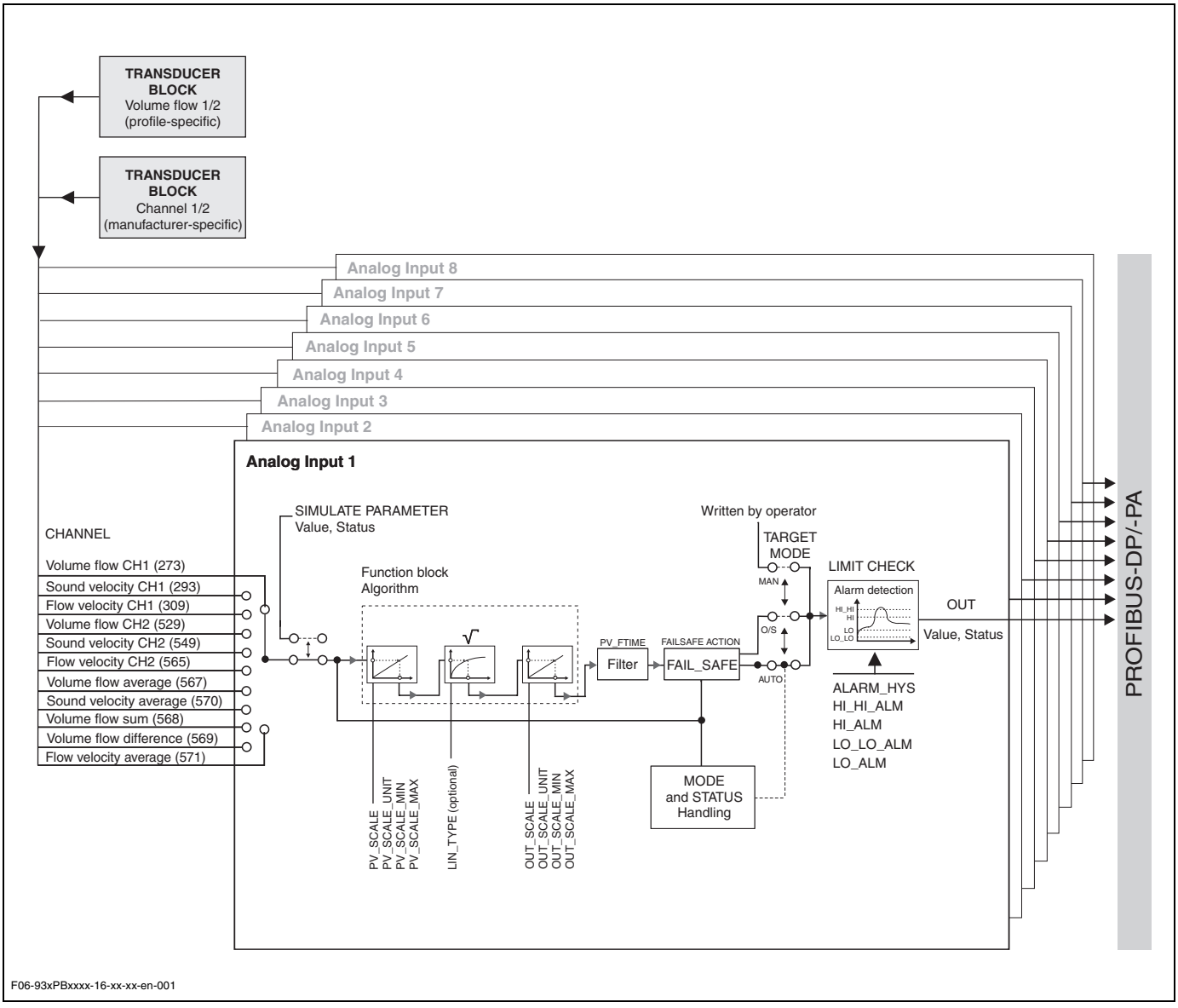


Fig. 3: Signal processing and structure of the Analog Input function blocks

The Analog Input function block receives its input value from the Transducer Block. The input values (process variables) can be assigned as required to the Analog Input Blocks by means of the CHANNEL parameter:

Possible settings (CHANNEL parameter)	Factory setting
CHANNEL = 273 → volume flow channel 1	AI 1
CHANNEL = 293 → sound velocity channel 1	AI 2
CHANNEL = 309 → flow velocity channel 1	AI 3
CHANNEL = 529 → volume flow channel 2	AI 4
CHANNEL = 549 → sound velocity channel 2	AI 5
CHANNEL = 565 → flow velocity channel 2	AI 6
CHANNEL = 567 → average volume flow	AI 7
CHANNEL = 570 → average sound velocity	AI 8
CHANNEL = 568 → volume flow sum	Assignable
CHANNEL = 569 → volume flow difference	Assignable
CHANNEL = 571 → average flow velocity	Assignable

The SIMULATE parameter group (see Page 160) 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 automation system can be tested.

In the PV_TIME parameter (see Page 156) a filter time can be specified for damping the converted input value (PV). If a time of 0 seconds is specified, the input value is not damped.
The BLOCK_MODE parameter group (see Page 160) 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 153) 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 most important functions and parameters of the Analog Input function block are listed below. You will find an overview of all the parameters available from Page 153 onwards.

4.2 Selecting the operating mode

The operating mode is set by means of the BLOCK_MODE parameter group (see Page 160). The Analog Input function block supports the following operating modes:
- AUTO (automatic mode)
- MAN (manual mode)
- O/S (out of service)

4.3 Selecting the units

The system units for the process variables 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 automation system. This ensures that there are no sudden changes in the measured values that could have an effect on the subsequent control routine.
If you want the change of unit to affect the measured value, you can activate the SET_UNIT_TO_BUS function (manufacturer-specific) by means of the local display or using Commuwin II (see Page 105).
Another way of changing the unit is to use the PV SCALE and OUT SCALE parameters (see Page 151 “Rescaling the input value”).

4.4 Status of the OUT output value

The status of the parameter group OUT communicates to the downstream 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 on status code and system/process error messages in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*).

4.5 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 160) 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 MODE_BLK parameter group (see Page 160) to MAN and specify the desired output value directly in the OUT parameter (see Page 153).

4.6 Error response (FAILSAFE_TYPE)

If an input or simulation value has the status BAD, the Analog Input function block uses the response defined in the FAILSAFE_TYPE parameter. The FAILSAFE_TYPE parameter (see Page 154) offers the following options:

- FSAFE VALUE
  The value specified in the FAILSAFE_VALUE parameter (see Page 154) is used for further processing.
- LAST GOOD VALUE
  The last good value is used for further processing.
- WRONG VALUE
  The current value is used for further 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 the OUT OF SERVICE mode.

4.7 Rescaling 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 measuring range of the device is 0...30 m^3/h.
- The output range to the automation system should be 0...100%.
- The measured value from the Transducer Block (input value) is rescaled linearly via the input scaling PV_SCALE to the desired output range OUT_SCALE.
- PV_SCALE parameter group (see Page 154)

  PV_SCALE_MIN (V1H0) = 0

  PV_SCALE_MAX (V1H1) = 30

- OUT_SCALE parameter group (see Page 155)

  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 m^3/h, 50% is output via the OUT parameter.

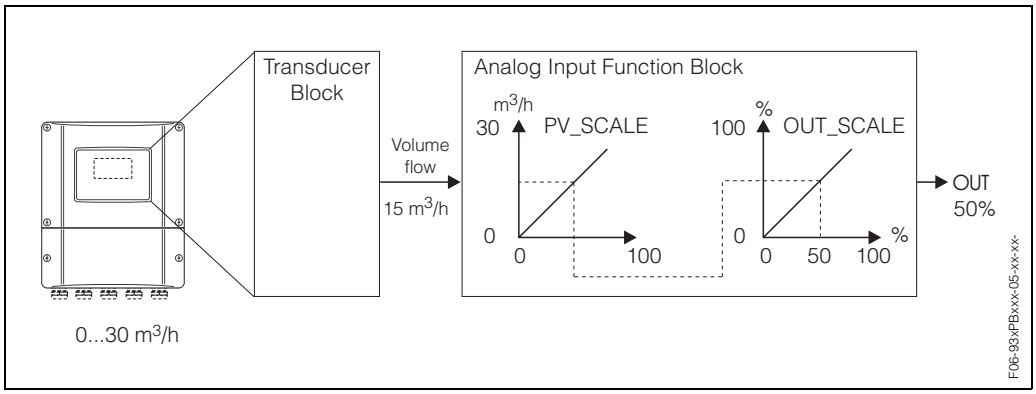


Fig. 4: Rescaling the input value (Prosonic Flow 93 PROFIBUS)

Note!
The “OUT_UNIT” does not have any effect on the scaling. It should be set nevertheless for the purposes of viewing on the local display, for example.

4.8 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 157).

The limit values are based on the output value OUT. If the output value OUT exceeds or undershoots the defined limit values, an alarm is sent to the automation system via the limit value process alarms.

The following limit values can be defined:

– HI_HI_LIM (see Page 158)
– HI_LIM (see Page 158)
– LO_LO_LIM (see Page 159)
– LO_LIM (see Page 159)

4.9 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 automation system by means of the following parameters:

– HI_HI_ALM (see Page 158)
– HI_ALM (see Page 158)
– LO_LO_ALM (see Page 159)
– LO_ALM (see Page 159)

4.10 Parameters: Analog Input function block

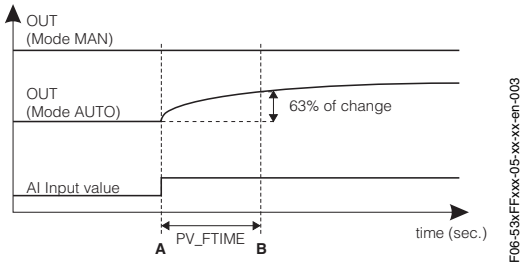
The following table shows all the parameters available for the Analog Input function blocks.

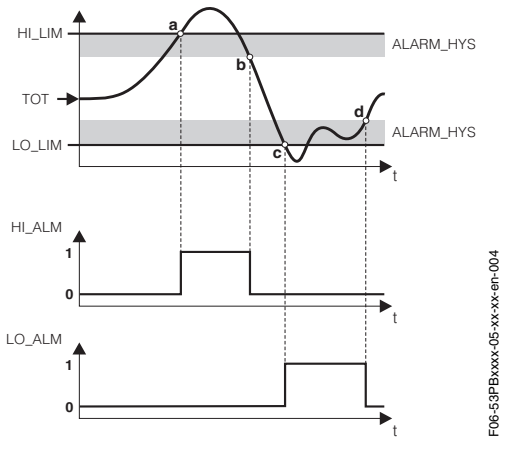
Abbreviations used in the table:
- R = Read
- W = Write
- P = Parameter, with a distinction between:
  – M = Mandatory parameter
  – O = Optional parameter

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
OUT (V0...)				
OUT VALUE (V0H0) *OUT (VALUE), (1...8/26)*	The output value with alarm weighting appears on the display. ✎ 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), (1...8/26)*	The current output status appears on the display. ✎ 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), (1...8/26)*	The quality of the output status appears on the display. **Display:** GOOD UNCERTAIN BAD	X		M
OUT SUB STATUS (V0H3) *OUT (STATUS BIT 2–5), (1...8/26)*	The sub-status in plain text appears on the display.	X		M
OUT LIMIT (V0H4) *OUT (LIMITS BIT 6–7), (1...8/26)*	The limit overshoot in plain text appears on the display. **Display:** O.K. → No limit overshoot HIGH LIMIT → HI LIMIT or/and HI HI LIMIT overshot LO LIMIT → LO LIMIT or/and LO LO LIMIT undershot	X		M

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
FAILSAFE ACTION (V0H6) *FAILSAFE_TYPE (1...8/33)*	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 MODE (automatic mode). **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. The status is set to UNCERTAIN – LAST USABLE VALUE. If no previous valid value is available, the initial value is returned with the status UNCERTAIN – INITIAL VALUE (for values that were not saved when the device was reset). The initial value for Prosonic Flow 93 PROFIBUS is “0”. • WRONG VALUE The current value is used for processing, despite the bad status. **Factory setting:** FSAFE VALUE (with value “0”)	X	X	O
FAILSAFE VALUE (V0H7) *FAILSAFE_VALUE (1...8/34)*	Use this parameter to enter a default value that will be displayed in OUT (output value) in the event of an error (see FAILSAFE_TYPE). **Factory setting:** 0	X	X	O
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 151.				
PV SCALE MIN (V1H0) *PV_SCALE (EU OF 0), (1...8/27)*	Use this parameter to enter the lower value for input scaling. **Factory setting:** 0	X	X	M
PV SCALE MAX (V1H1) *PV_SCALE (EU OF 100), (1...8/27)*	Use this parameter to enter the upper value for input scaling. **Factory setting:** 100	X	X	M
TYPE OF LIN (V1H2) *LIN_TYPE (1...8/29)*	Use this parameter to select a characteristic line to be used in characteristic-line transformation. ✎ Note! Linearisation cannot be set with Prosonic Flow 93 PROFIBUS.	X	X	M

Analog Input function blocks AI 1...8 (analog inputs)				
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). Defining the measuring range in this parameter group does not restrict the output value OUT. If the output value OUT is outside the measuring range, this value is transferred nonetheless.				
OUT SCALE MIN (V1H3) *OUT_SCALE (EU OF 0%), (1...8/28)*	Use this parameter to select the lower value for output scaling. **Factory setting:** 0	X	X	M
OUT SCALE MAX (V1H4) *(EU OF 100%),* *(1...8/28)*	Use this parameter to select the upper value for output scaling. **Factory setting:** 100	X	X	M
OUT UNIT (V1H5) *OUT_SCALE (1...8/28)*	Use this parameter to enter the output unit. **Factory setting:** AI 1 = m^3/h AI 2 = m/s AI 3 = m/s AI 4 = m^3/h AI 5 = m/s AI 6 = m/s AI 7 = m^3/h AI 8 = m/s ✎ Note! OUT_UNIT (output unit) has no effect on measured-value scaling.	X	X	M
USER UNIT (V1H6) *OUT_UNIT_TEXT (1...8/51)*	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:** (_ _ _ _) no 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 Prosonic Flow 93 PROFIBUS.	X	X	M

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
RISING TIME (V1H8) *PV_FTIME (1...8/32)*	For entering 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 (input value) changes. **B** → The OUT (output value) has reacted 63% to the change in the Analog Input (input value). **Factory setting:** 0 s	X	X	M

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
ALARM LIMITS (V2...)				
ALARM HYSTERESIS (V2H0) *ALARM_HYS (1...8/35)*	For entering 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 Analog Input 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 OUT_SCALE parameter group in the Analog Input function block (see Page 155). • 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 (grey 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 undershoots the hysteresis value of HI_LIM, HI_ALM is deactivated. **d** → OUT output value undershoots the LO_LIM limit value, LO_ALM is activated. **e** → OUT output value exceeds the hysteresis value of LO_LIM, LO_ALM is deactivated. 	X	X	M

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
HI HI ALARM (V3...)				
HI HI LIM (V3H0) *HI_HI_LIM (1...8/37)*	For entering 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), (1...8/46)*	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), (1...8/46)*	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), (1...8/46)*	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), (1...8/46)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
HI ALARM (V4...)				
HI LIM (V4H0) *HI_LIM (1...8/39)*	For entering 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), (1...8/47)*	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), (1...8/47)*	Use this parameter to view the current status of the HI_ALARM.	X		O
SWITCH-ON POINT (V4H3) *HI_ALM (SWITCH-ON POINT), (1...8/47)*	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), (1...8/47)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
LO ALARM (V5...)				
LO LIM (V5H0) *LO_LIM (1...8/41)*	For entering the alarm limit value for the lower warning (LO_ALM). If the output value OUT undershoots 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), (1...8/48)*	Alarm-status parameter for the lower warning limit. Content includes the value that violated the limit.	X		O
ALARM STATE (V5H2) *LO_ALM (ALARM_STATE), (1...8/48)*	Use this parameter to view the current status of the LO_ALARM.	X		O
SWITCH-ON POINT (V5H3) *LO_ALM (SWITCH-ON POINT), (1...8/48)*	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), (1...8/48)*	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 (1...8/43)*	For entering the alarm limit value for the lower alarm (LO_LO_ALM). If the output value OUT undershoots 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), (1...8/49)*	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), (1...8/49)*	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), (1...8/49)*	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), (1...8/49)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
SIMULATION (V7...)				
SIMULATION VALUE (V7H0) *SIMULATE (1...8/50)*	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), (1...8/50)*	Use this parameter to simulate the status of the Analog Input (AI) Block.	X	X	O
SIMULATION MODE (V7H2) *SIMULATE (MODE), (1...8/50)*	Use this parameter to activate simulation of the Analog Input function block. **User input:** OFF ON **Factory setting:** OFF	X	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 (1...8/21)*	For selecting the desired operating mode. **Options:** AUTO MAN O/S **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLK (ACTUAL), (1...8/22)*	The current operating mode appears on the display. **Display:** AUTO	X		M
NORMAL (V8H2) *MODE_BLK (NORMAL), (1...8/22)*	The operating mode for normal operation appears on the display. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLK (PERMITTED), (1...8/22)*	The permissible operating modes appear on the display. **Display:** AUTO	X		M

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
CHANNEL (V8H5) *CHANNEL (1...8/30)*	Use this parameter for assignment between the logical hardware channels of the Transducer Block and the input of the Analog Input function block. The Transducer Block of Prosonic Flow 93 PROFIBUS makes eight process variables available to the input channels of the Analog Input function blocks: **Options:** 273 = Volume flow channel 1 293 = Sound velocity channel 1 309 = Flow velocity channel 1 529 = Volume flow channel 2 549 = Sound velocity channel 2 565 = Flow velocity channel 2 567 = Average volume flow 570 = Average sound velocity 568 = Volume flow sum 569 = Volume flow difference 571 = Average flow velocity **Factory setting:** 273 = Volume flow channel 1 (AI 1) 293 = Sound velocity channel 1 (AI 2) 309 = Flow velocity channel 1 (AI 3) 529 = Volume flow channel 2 (AI 4) 549 = Sound velocity channel 2 (AI 5) 565 = Flow velocity channel 2 (AI 6) 567 = Average volume flow (AI 7) 570 = Average sound velocity (AI 8)	X	X	M
UNIT MODE (V8H7) –	Use this parameter to select the form in which you want the units displayed. **Options:** list number In the **list** mode the units are displayed with the conventional abbreviations (e.g. l/s). In the **number** mode the units are displayed in the numerical code defined in the 3.0 Profiles, e.g. 1351 (l/s). **Factory setting:** list	X	X	O
ALARM CONFIG (V9...) The Active Block Alarm is supported which flags a change in a parameter with static parameters (Static attribute) for 10 seconds and indicates that a warning limit or an alarm limit has been violated in the Analog Input function block.				
CURRENT (V9H0) *ALARM_SUMMARY (CURRENT), (1...8/23)*	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUMMARY (DISABLE), (1...8/23)*	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
UNACKNOWLEDGED (V9H2) *ALARM_SUMMARY (UNACKNOWLEDGED), (1...8/23)*	✎ Note! This parameter is not available in this profile version.			
UNREPORTED (V9H3) *ALARM_SUMMARY (UNREPORTED), (1...8/23)*	✎ Note! This parameter is not available in this profile version.			
ST REVISION (V9H5) *ST_REV (1...8/17)*	A block has static parameters (Static attribute) that are not changed by the process. Static parameters whose values change during optimisation or configuration will 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 (1...8/18)*	For entering a user-specific text of max. 32 characters for unique identification and assignment of the block. **Factory setting:** "_ _ _ _ _ _ _ _" no text	X	X	M
STRATEGY (VAH1) *STRATEGY (1...8/19)*	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 (1...8/20)*	For entering the identification number of the plant unit. This information can be used by the control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3) –	The profile version implemented in the device appears on the display. **Display:** 30	X		O

Analog Input function blocks AI 1...8 (analog inputs)				
Matrix text (Commuwin II) ***Parameter (Slot / Index)***	**Description**	**R**	**W**	**P**
BATCH (VAH4...7) Batch is a structured parameter consisting of four elements. This parameter is used in batch applications in accordance 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 automation system as a means of flagging the input 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), (1...8/24)*	ID of a batch application as a means of assigning device messages (alarms, errors).	X	X	M
BATCH RUP (VAH5) *BATCH (RUP), (1...8/24)*	Use this parameter to enter the code for a formula needed for the batch application, or the unit, such as reactors.	X	X	M
BATCH PHASE (VAH6) *BATCH (PHASE), (1...8/24)*	Use this parameter to write or show the current recipe phase.	X	X	M
BATCH OPERATION (VAH7) *BATCH (OPERATION), (1...8/24)*	Use this parameter to write or show the current formula.	X	X	M

5 Totalizer Function Block

The Totalizer function block is used whenever a physical measured variable, generally flow, has to be totalled over a period of time.
In the case of Prosonic Flow 93 PROFIBUS, the variables are volume flow (CH1, CH2), average volume flow, volume flow sum and volume flow difference. Like the Analog Input function block, the totalizer also receives its input values from a Transducer Block.

5.1 Signal processing

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

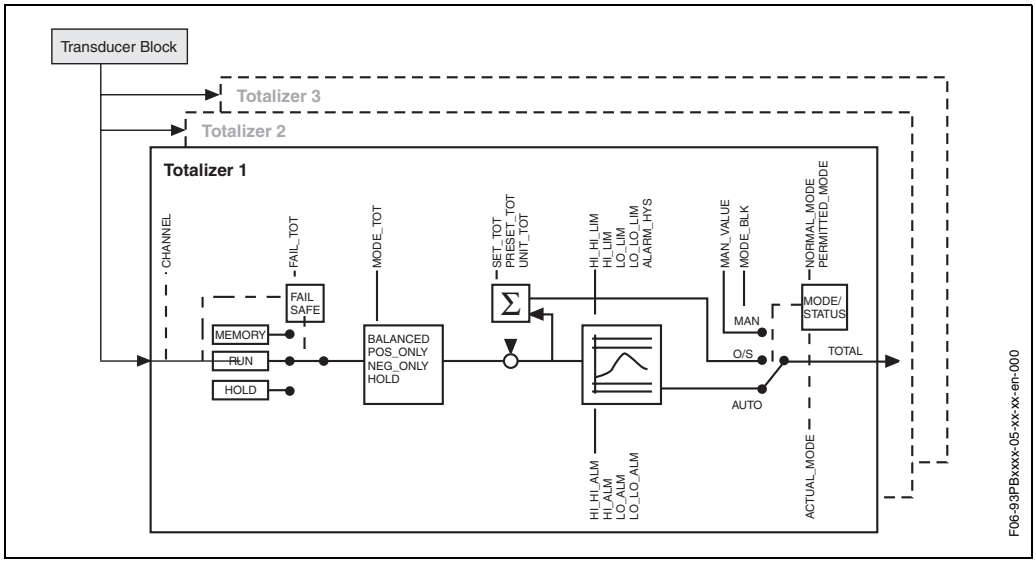


Fig. 5: Signal processing and structure of the Totalizer function blocks

The Totalizer function block receives its input value from the Transducer function block. The CHANNEL parameter (see Page 174) is used to select the input value to be processed by the Totalizer function block. The following settings can be made with Commuwin II and via the local display:

- Local display:
  – OFF
  – VOLUME FLOW CH1
  – VOLUME FLOW CH2 (if channel 2 is activated)
  – VOLUME FLOW AVERAGE (if channel 2 is activated)
  – VOLUME FLOW SUM (if channel 2 is activated)
  – VOLUME FLOW DIFFERENCE (if channel 2 is activated)
- Commuwin II:
  – CHANNEL = 273 (volume flow channel 1)
  – CHANNEL = 529 (volume flow channel 2)
  – CHANNEL = 567 (average volume flow)
  – CHANNEL = 568 (volume flow sum)
  – CHANNEL = 569 (volume flow difference)

The MODE-BLK parameter group (see Page 174) 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 (manual) operating mode. 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 from Page 168 onwards.

5.2 Selecting the operating mode

The operating mode is set by means of the BLOCK_MODE parameter group (see Page 174). The Totalizer function block supports the following operating modes:
- AUTO (automatic mode)
- MAN (manual mode)
- O/S (out of service)

5.3 Unit of the totalled measured value (UNIT TOT)

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

5.4 Status of the TOTAL output value

The status of the Totalizer function block and the validity of the TOTAL output value are transmitted to the downstream function blocks by means of the status of the TOTAL parameter group. 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 on status code and system/process error messages in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*).

5.5 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 169) offers the following options:

- RUN
  The totalizer continues to total despite the BAD input value.

- HOLD
  The totalizer stops; BAD input values are not totalled.

- MEMORY
  The totalizer continues to total with the last valid input value (not statused BAD).

RUN is the factory setting for the FAIL_TOT parameter.

5.6 Selecting the direction for totalling (MODE TOT)

Use the MODE_TOT parameter (see Page 170) to define the direction in which the totalizer totals. The options are totalling only positive values, only negative values, or all values (positive and negative), or stop the totalizer. The totalled 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 totalled
- POS_ONLY → Only positive values are totalled
- NEG_ONLY → Only negative values are totalled
- HOLD → Totalizer is stopped

BALANCED is activated in the factory setting for the MODE_TOT parameter.

You will find information on integration into an automation system in the examples dealing with system integration and configuration in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*.

5.7 Initial setting of the totalizer (SET TOT)

Use the SET_TOT parameter (see Page 170) to start totalling (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 sets it to the preset value, respectively, but does not stop the totalizer. This means that it immediately recommences totalling from the new setting. If you want to stop the totalizer you must select HOLD in the MODE_TOT parameter.

TOTALIZER is active in the default for the SET_TOT parameter.

You will find information on integration into an automation system in the examples dealing with system integration and configuration in the Operating Instructions *Prosonic Flow 93 PROFIBUS, BA 076D/06/en*.

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 171).

The limit values are based on the output value TOTAL. If the output value TOTAL exceeds or undershoots the defined limit values, an alarm is sent to the automation system via the limit value process alarms.

The following limit values can be defined:

- HI_HI_LIM (see Page 172)
- HI_LIM (see Page 172)
- LO_LO_LIM (see Page 173)
- LO_LIM (see Page 173)

5.9 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 automation system by means of the following parameters:

- HI_HI_ALM (see Page 172)
- HI_ALM (see Page 172)
- LO_LO_ALM (see Page 173)
- LO_ALM (see Page 173)

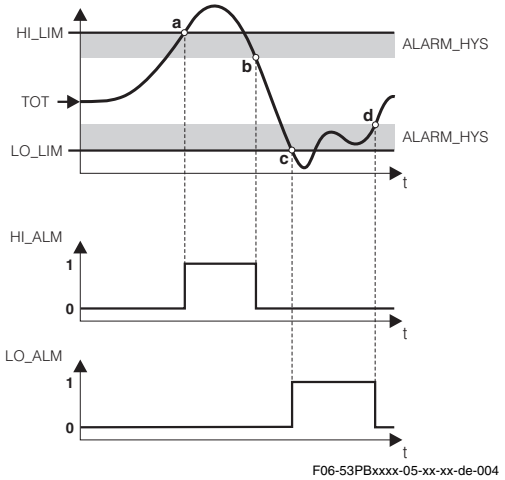
5.10 Parameters: Totalizer function block

The following table shows all the parameters available for 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), (9...11/26)*	The output value with alarm weighting appears on the display. ✎ 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
TOTAL. STATUS (V0H1) *TOTAL (Status), (9...11/26)*	The current output status appears on the display. ✎ 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
TOTAL. STATUS (V0H2) *TOTAL (Status Bit 0–1), (9...11/26)*	The quality of the output status appears on the display. **Display:** GOOD UNCERTAIN BAD	X		M
TOTAL. SUB STATUS (V0H3) *TOTAL (Status Bit 2–5), (9...11/26)*	The sub-status in plain text appears on the display.	X		M
TOTAL. LIMIT (V0H4) *TOTAL (Limits Bit 6–7), (9...11/26)*	The limit overshoot in plain text appears on the display. **Display:** O.K. → No limit overshoot HIGH LIMIT → HI LIMIT or/and HI HI LIMIT overshot LO LIMIT → LO LIMIT or/and LO LO LIMIT undershot	X		M

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
FAILSAFE MODE (V0H6) *FAIL_TOT (9...11/31)*	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 MODE (automatic mode). **Options:** RUN The totalizer continues to total despite the BAD input value. HOLD The totalizer stops; BAD input values are not totalled. MEMORY The totalizer continues to total with the last valid input value (not statused BAD). **Factory setting:** RUN			
CONFIGURATION (V1...)				
TOTAL. UNIT (V1H0) *UNIT_TOT (9...11/27)*	For selecting the unit for the measured variable. **Options (volume):** Metric → cm^3; dm^3; m^3; ml; l; hl US → ft^3; gal; bbl **Factory setting (volume):** m^3	X	X	M
SET TOTALIZER (V1H1) *SET_TOT (9...11/29)*	Use this parameter to assign a status 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 (9...11/32)*	Use this parameter to specify a start value for the totalizer. The totalizer does not accept this value unless “PRESET” was selected in the SET_TOT parameter. **Factory setting:** 0	X	X	M

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
TOTALIZER MODE (V1H3) *MODE_TOT (9...11/30)*	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 at the last value. No further flow components are totalled. **Factory setting:** Totalizer 1: BALANCED Totalizer 2: POS_ONLY Totalizer 3: NEG_ONLY	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 (9...11/33)*	For entering 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 (grey 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 undershoots the hysteresis value of HI_LIM, HI_ALM (VALUE) is deactivated. **c** = TOTAL undershoots the limit value LO_LIM, LO_ALM (VALUE) is activated. **d** = TOTAL exceeds the hysteresis value of LO_LIM, LO_ALM (VALUE) is deactivated.  F06-53PBxxxx-05-xx-xx-de-004	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 (9...11/34)*	For entering 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), (9...11/38)*	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), (9...11/38)*	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), (9...11/38)*	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), (9...11/38)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
HI ALARM (V4...)				
HI LIM (V4H0) *HI_LIM (9...11/35)*	For entering 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), (9...11/39)*	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), (9...11/39)*	Use this parameter to view the current status of the HI_ALARM.	X		O
SWITCH-ON POINT (V4H3) *HI_ALM (SWITCH-ON POINT), (9...11/39)*	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), (9...11/39)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
LO ALARM (V5...)				
LO LIM (V5H0) *LO_LIM (9...11/36)*	For entering the alarm limit value for the lower warning (LO_ALM). If the output value TOTAL undershoots 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), (9...11/40)*	Alarm-status parameter for the lower warning limit. Content includes the value that violated the limit.	X		O
ALARM STATE (V5H2) *LO_ALM (ALARM_STATE), (9...11/40)*	Use this parameter to view the current status of the LO_ALARM.	X		O
SWITCH-ON POINT (V5H3) *LO_ALM (SWITCH-ON POINT), (9...11/40)*	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), (9...11/40)*	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 (9...11/37)*	For entering the alarm limit value for the lower alarm (LO_LO_ALM). If the output value TOTAL undershoots 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), (9...11/41)*	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), (9...11/41)*	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), (9...11/41)*	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), (9...11/41)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT / INDEX)***	**Description**	**R**	**W**	**P**
BLOCK MODE (V8...) 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 (9...11/21)*	For selecting the desired operating mode. **Options:** AUTO MAN O/S **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLK (ACTUAL), (9...11/22)*	The current operating mode appears on the display. **Display:** AUTO	X		M
NORMAL (V8H2) *MODE_BLK (NORMAL), (9...11/22)*	The operating mode for normal operation appears on the display. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLK (PERMITTED), (9...11/22)*	The permissible operating modes appear on the display. **Display:** AUTO	X		M
CHANNEL (V8H5) *CHANNEL (9...11/28)*	Use this parameter for assignment between the logical hardware channels of the Transducer Block and the input of the Totalizer Block. The Transducer Block of Prosonic Flow 93 PROFIBUS makes several process variables available to the input channels of the Totalizer function block, depending on the setting (CH1 or CH1+CH2). **Options:** CHANNEL = 273 (volume flow channel 1) CHANNEL = 529 (volume flow channel 2) CHANNEL = 567 (average volume flow) CHANNEL = 568 (volume flow sum) CHANNEL = 569 (volume flow difference)	X	X	M

Totalizer function block				
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. **Options:** list number In the **list** mode the units are displayed with the conventional abbreviations (e.g. l/s). In the **number** mode the units are displayed in the numerical code defined in the 3.0 Profiles, e.g. 1034 (m^3). **Factory setting:** list	X	X	O
ALARM CONFIG (V9...) The Active Block Alarm is supported which flags a change in a parameter with static parameters (Static attribute) for 10 seconds and indicates that a warning limit or an alarm limit has been violated in the Analog Input function block.				
CURRENT (V9H0) *ALARM_SUMMARY (CURRENT), (9...11/23)*	Use this parameter to view information about the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUMMARY (DISABLE), (9...11/23)*	Use this parameter to view information about the acknowledged alarms of the measuring device.	X		M
UNACKOWLEDGED (V9H2) *ALARM_SUMMARY (UNACKNOWLEDGED), (9...11/23)*	✎ Note! This parameter is not available in this profile version.			
UNREPORTED (V9H3) *ALARM_SUMMARY (UNREPORTED), (9...11/23)*	✎ Note! This parameter is not available in this profile version.			
ST REVISION (V9H5) *ST_REV (9...11/17)*	A block has static parameters (Static attribute) that are not changed by the process. Static parameters whose values change during optimisation or configuration will 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 (9...11/18)*	For entering a user-specific text of max. 32 characters for unique identification and assignment of the block. **Factory setting:** "_ _ _ _ _ _ _ _" no text	X	X	M
STRATEGY (VAH1) *STRATEGY (9...11/19)*	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 (9...11/20)*	For entering the identification number of the plant unit. This information can be used by the control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3) –	The profile version implemented in the device appears on the display. **Display:** 30	X		O
BATCH (VAH4–7) Batch is a structured parameter consisting of four elements. This parameter is used in batch applications in accordance 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 automation system as a means of flagging the input 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), (9...11/24)*	ID of a batch application as a means of assigning device messages (alarms, errors).	X	X	M
BATCH RUP (VAH5) *BATCH (RUP), (9...11/24)*	Use this parameter to enter the code for a formula needed for the batch application, or the unit, such as reactors.	X	X	M
BATCH PHASE (VAH6) *BATCH (PHASE), (9...11/24)*	Use this parameter to write or show the current recipe phase.	X	X	M
BATCH OPERATION (VAH7) *BATCH (OPERATION), (9...11/24)*	Use this parameter to write or show the current formula.	X	X	M

6 Slot/Index Lists

6.1 General 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. Parameter fields in a grey background indicate manufacturer-specific parameters.

- 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 Unsigned 8, OctetString, etc.
  – Float → IEEE 754 format
  – Integer → 8 (range of values –128...127), 16 (–327678...327678), 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

6.2 Physical Block – Slot 0

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Physical Block – Slot 0 (shaded grey) = manufacturer-specific parameters									
not used	–	0–15	–	–	–	–	–	–	–
PB_BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
PB_ST_REV	P. 87	17	X	–	Simple	M	Unsigned16	2	N
PB_TAG_DESC	P. 88	18	X	X	Simple	M	Octet String	32	W
PB_STRATEGY	P. 88	19	X	X	Simple	M	Unsigned16	2	W
PB_ALERT_KEY	P. 88	20	X	X	Simple	M	Unsigned8	1	W
PB_TARGET_MODE	P. 87	21	X	X	Simple	M	Unsigned8	1	W
PB_MODE_BLK	P. 87	22	X	–	Record	M	DS-37	3	D
PB_ALARM_SUM	P. 87	23	X	–	Record	M	DS-42	8	D
PB_SOFTWARE_REVISION	P. 83	24	X	–	Simple	M	Octet String	16	Cst
PB_HARDWARE_REVISION	P. 83	25	X	–	Simple	M	Octet String	16	Cst
PB_DEVICE_MAN_ID	P. 83	26	X	–	Simple	M	Unsigned16	2	Cst
PB_DEVICE_ID	P. 83	27	X	–	Simple	M	Octet String	16	Cst

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Physical Block – Slot 0 (shaded grey) = manufacturer-specific parameters									
PB_DEVICE_SER_NUM	P. 83	28	X	–	Simple	M	Octet String	16	Cst
PB_DIAGNOSIS	P. 86	29	X	–	Simple	M	Octet String	4	D
PB_DIAGNOSIS_EXT	P. 86	30	X	–	Simple	O	Octet String	6	D
PB_DIAGNOSIS_MASK	P. 86	31	X	–	Simple	M	Octet String	4	Cst
PB_DIAGNOSIS_MASK_EXTENS	P. 86	32	X	–	Simple	O	Octet String	6	Cst
PB_DEVICE_CERTIFICATION	P. 83	33	X	–	Simple	O	Octet String	32	Cst
PB_WRITE_LOCKING	P. 84	34	X	X	Simple	O	Unsigned16	2	N
PB_FACTORY_RESET	P. 84	35	X	X	Simple	O	Unsigned16	2	W
PB_DESCRIPTOR	P. 83	36	X	X	Simple	O	Octet String	32	W
PB_DEVICE_MESSAGE	P. 83	37	X	X	Simple	O	Octet String	32	W
PB_DEVICE_INSTAL_DATE	P. 83	38	X	X	Simple	O	Octet String	16	W
not used	–	39	–	–	–	–	–	–	–
PB_IDENT_NUMBER_SELECTOR	P. 85	40	X	X	Simple	M	Unsigned8	1	W
PB_HW_WRITE_PROTECTION	P. 85	41	X	–	Simple	O	Unsigned8	1	D
not used	–	42–48	–	–	–	–	–	–	–
PB_ACTUAL_ERROR_CODE	P. 136	49	X		Simple	O	Unsigned16	2	D
not used	–	50	–	–	–	–	–	–	–
PB_UPDOWN_FEAT_SUPP	–	51	X		Simple	M	Octet String	1	Cst
PB_UPDOWN_CONT_PARA	–	52	X	X	Simple	O	Unsigned8	1	D
PB_UPDOWN_PARA	–	53	X	X	Record	O	UpDownData	20	D
PB_DEV_BUS_ADDR	P. 106	54	X	–	Simple	O	Unsigned8	1	D
not used	–	55	–	–	–	–	–	–	–
PB_SET_UNIT_TO_BUS	P. 105	56	X	X	Simple	O	Unsigned8	1	N
PB_LOCAL_DISPLAY_INPUT	P. 106	57	X	–	Record	O	DS-33	5	D
not used	–	58	–	–	–	–	–	–	–
PB_MEASID	–	59	X		Simple	O	Unsigned8	1	D
PB_SERIAL_NUM	P. 140	60	X	X	Simple	O	OctetString	16	W
PB_SENSOR_TYPE	–	61	X	X	Simple	O	OctetString	16	W
PB_HW_REV_SENSOR	–	62	X	X	Simple	O	OctetString	16	W
PB_HW_IDENT_SENSOR	–	63	X	X	Simple	O	OctetString	16	W
PB_PROD_NUM_SENSOR	–	64	X	X	Simple	O	OctetString	16	W
PB_SW_REV_S_DAT	–	65	X	X	Simple	O	OctetString	16	W
PB_HW_REV_AMP	–	66	X	X	Simple	O	OctetString	16	W
PB_HW_IDENT_AMP	–	67	X	X	Simple	O	OctetString	16	W
PB_SW_REV_AMP	P. 140	68	X	X	Simple	O	OctetString	16	W
PB_SW_IDENT_AMP	–	69	X	X	Simple	O	OctetString	16	W
PB_PROD_NUM_AMP	–	70	X	X	Simple	O	OctetString	16	W
PB_IO_TYPE	P. 140	71	X	–	Simple	O	Unsigned8	1	N
PB_HW_REV_IO	–	72	X	X	Simple	O	OctetString	16	W
PB_HW_IDENT_IO	–	73	X	X	Simple	O	OctetString	16	W
PB_SW_REV_IO	P. 140	74	X	X	Simple	O	OctetString	16	W
PB_SW_IDENT_IO	–	75	X	X	Simple	O	OctetString	16	W
PB_PROD_NUM_IO	–	76	X	X	Simple	O	OctetString	16	W
PB_SW_REV_T_DAT	P. 140	77	X	X	Simple	O	OctetString	16	W
PB_HMI_LANGUAGE	P. 119	78	X	X	Simple	O	Unsigned8	1	W

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Physical Block – Slot 0 (shaded grey) = manufacturer-specific parameters									
PB_HMI_DAMPING	P. 119	79	X	X	Simple	O	Float	4	W
PB_HMI_LCD_CONTRAST	P. 119	80	X	X	Simple	O	Float	4	W
not used	–	81–83	–	–	–	–	–	–	–
PB_PREV_SYS_COND	P. 136	84	X	–	Simple	O	Unsigned16	2	D
not used	–	85–87	–	–	–	–	–	–	–
PB_TROUBLESHOOTING	P. 136	88	X	X	Simple	O	Unsigned8	1	W
PB_OPERATION_HOURS	–	89	X		Simple	O	Float	4	N
not used	–	90–103	–	–	–	–	–	–	–
PB_HMI_MAIN_L_ASSIGN	P. 121	104	X	X	Simple	O	Unsigned8	1	W
PB_HMI_MAIN_L_100_VALUE	P. 121	105	X	X	Simple	O	Float	4	W
PB_HMI_MAIN_L_FORMAT	P. 122	106	X	X	Simple	O	Unsigned8	1	W
not used	–	107–114	–	–	–	–	–	–	–
PB_HMI_MAIN_L_MUX_ASSIGN	P. 122	115	X	X	Simple	O	Unsigned8	1	W
PB_HMI_MAIN_L_MUX_100_ VALUE	P. 123	116	X	X	Simple	O	Float	4	W
PB_HMI_MAIN_L_MUX_FORMAT	P. 123	117	X	X	Simple	O	Unsigned8	1	W
PB_HMI_ADD_L_ASSIGN	P. 124	118	X	X	Simple	O	Unsigned8	1	W
PB_HMI_ADD_L_100_VALUE	P. 125	119	X	X	Simple	O	Float	4	W
PB_HMI_ADD_L_FORMAT	P. 125	120	X	X	Simple	O	Unsigned8	1	W
PB_HMI_ADD_L_DISP_MODE	P. 126	121	X	X	Simple	O	Unsigned8	1	W
PB_HMI_ADD_L_MUX_ASSIGN	P. 127	122	X	X	Simple	O	Unsigned8	1	W
PB_HMI_ADD_L_MUX_100_ VALUE	P. 128	123	X	X	Simple	O	Float	4	W
PB_HMI_ADD_L_MUX_FORMAT	P. 128	124	X	X	Simple	O	Unsigned8	1	W
PB_HMI_ADD_L_MUX_DISP_ MODE	P. 129	125	X	X	Simple	O	Unsigned8	1	W
PB_HMI_INFO_L_ASSIGN	P. 130	126	X	X	Simple	O	Unsigned8	1	W
PB_HMI_INFO_L_100_VALUE	P. 131	127	X	X	Simple	O	Float	4	W
PB_HMI_INFO_L_FORMAT	P. 131	128	X	X	Simple	O	Unsigned8	1	W
PB_HMI_INFO_L_DISP_MODE	P. 132	129	X	X	Simple	O	Unsigned8	1	W
PB_HMI_INFO_L_MUX_ASSIGN	P. 133	130	X	X	Simple	O	Unsigned8	1	W
PB_HMI_INFO_L_MUX_100_ VALUE	P. 133	131	X	X	Simple	O	Float	4	W
PB_HMI_INFO_L_MUX_FORMAT	P. 134	132	X	X	Simple	O	Unsigned8	1	W
PB_HMI_INFO_L_MUX_DISP_ MODE	P. 134	133	X	X	Simple	O	Unsigned8	1	W
PB_HMI_XLINE_CALC_M_VAL	P. 120	134	X	X	Simple	O	Unsigned8	1	W
not used	–	135–139							
VIEW_PHYSICAL BLOCK	–	140	X	X	Simple	M	Unsigned16, DS-37,DS-42, Octet String[4]	17	D
not used	–	141–143	–	–	–	–	–	–	–

6.3 Device management – Slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Device management – Slot 1									
Directory_Header/Composite_Directory_Entries	–	0	X	–	Record	M	Unsigned16	12	C
Composite_List_Entries	–	1	X	–	Record	M	Unsigned16	12*/ 12**	C
Composite_Directory_Entries	–	2	X	–	Record	M	Unsigned16	56*/ 24**	C
not used	–	3–15	–	–	–	–	–	–	–
* manufacturer-specific ** profile-specific									

6.4 Transducer Block – Slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Transducer Block – Slot 1 (shaded grey) = manufacturer-specific parameters									
TB_BLOCK_OBJECT	–	70	X	–	Record	M	DS-32	20	C
ST_REV	P. 146	71	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 146	72	X	X	Simple	M	OctetString	32	W
STRATEGY	P. 146	73	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 147	74	X	X	Simple	M	Unsigned8	1	W
TARGET_MODE	P. 145	75	X	X	Simple	M	Unsigned8	1	W
MODE_BLK	–	76	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 146	77	X	–	Record	M	DS-42	8	D
CALIBR_FACTOR	P. 144	78	X	X	Simple	M	Float	4	W
LOW_FLOW_CUTOFF	P. 143	79	X	X	Simple	M	Float	4	W
MEASUREMENT_MODE	P. 143	80	X	X	Simple	M	Unsigned8	1	W
FLOW_DIRECTION	P. 143	81	X	X	Simple	M	Unsigned8	1	W
ZERO_POINT	P. 144	82	X	X	Simple	M	Float	4	W
ZERO_POINT_ADJUST	P. 144	83	X	X	Simple	M	Unsigned8	1	N
ZERO_POINT_UNIT	P. 144	84	X	X	Simple	M	Unsigned16	2	W
NOMINAL_SIZE	P. 144	85	X	X	Simple	M	Float	4	W
NOMINAL_SIZE_ UNIT	P. 144	86	X	X	Simple	M	Unsigned16	2	W
VOLUME_FLOW	P. 92 / P. 142	87	X	–	Record	M	DS-33	5	D
VOLUME_FLOW_UNIT	P. 94 / P. 142	88	X	X	Simple	M	Unsigned16	2	W
VOLUME_FLOW_LO_LIMIT	P. 142	89	X	X	Simple	M	Float	4	W
VOLUME_FLOW_HI_LIMIT	P. 142	90	X	X	Simple	M	Float	4	W
not used	–	91–106	–	–	–	–	–	–	–
SOUND_VELOCITY	P. 92 / P. 142	107	X	–	Record	M	DS-33	5	D
SOUND_VELOCITY_UNIT	P. 94 / P. 143	108	X	X	Simple	M	Unsigned16	2	W
SOUND_VELOCITY_LO_LIMIT	P. 143	109	X	X	Simple	M	Float	4	W
SOUND_VELOCITY_HI_LIMIT	P. 143	110	X	X	Simple	M	Float	4	W
not used	–	111–122	–	–	–	–	–	–	–
FLOW_VELOCITY	P. 92	123	X	–	Record	O	DS-33	5	D
SIGNALSTRENGTH	P. 92	124	X	–	Simple	O	Float	4	N
not used	–	125–130	–	–	–	–	–	–	–
TEMP_UNIT	P. 95	131	X	X	Simple	O	Unsigned16	2	W
VISCOSITY_UNIT	P. 95	132	X	X	Simple	O	Unsigned16	2	W
not used	–	133	–	–	–	–	–	–	–
LOCK_ACCESS_ CODE	P. 96	134	X	X	Simple	O	Signed16	2	N
LOCK_PRIVATE_CODE	P. 96	135	X	X	Simple	O	Signed16	2	W
LOCK_ACCESS_ STATUS	P. 96	136	X	–	Simple	O	Unsigned8	1	D
not used	–	137–142	–	–	–	–	–	–	–
PROFIBUS_ BLOCK_ SELECTION	P. 105	143	X	X	Simple	O	Unsigned8	1	W
PROFIBUS_OUT_VALUE	P. 106	144	X	–	Record	O	DS-33	5	N

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Transducer Block – Slot 1 (shaded grey) = manufacturer-specific parameters									
PROFIBUS_ ACTUAL_ BAUDRATE	P. 106	145	X	–	Simple	O	Unsigned8	1	N
PROFIBUS_CHECK_CONFIG	P. 107	146	X	–	Simple	O	Signed16	2	N
PROFIBUS_DEVICE_ID	P. 107	147	X	–	Simple	O	Unsigned8	1	N
not used	–	148–150	–	–	–	–	–	–	–
LOW_FLOW_CUTOFF_ASSIGN	P. 97	151	X	X	Simple	O	Unsigned8	1	W
LOW_FLOW_CUTOFF_OFF_ VALUE	P. 97	152	X	X	Simple	O	Float	4	W
SYSTEM_PRESSURE_SHOCK_ SUPPRESS	P. 98	153	X	X	Simple	O	Float	4	W
not used	–	154	–	–	–	–	–	–	–
PIPE_STANDARD	P. 99	155	X	X	Simple	O	Unsigned8	1	W
NOMINAL_DIAMETER	P. 99	156	X	X	Simple	O	Unsigned8	1	W
PIPE_MATERIAL	P. 100	157	X	X	Simple	O	Unsigned8	1	W
REFERENCE_VALUE	P. 100	158	X	X	Simple	O	Float	4	W
SOUND_VELOCITY_PIPE	P. 101	159	X	X	Simple	O	Float	4	W
CIRCUMFERENCE	P. 101	160	X	X	Simple	O	Float	4	N
PIPE_DIAMETER	P. 102	161	X	X	Simple	O	Float	4	N
WALL_THICKNESS	P. 102	162	X	X	Simple	O	Float	4	N
LINER_MATERIAL	P. 103	163	X	X	Simple	O	Unsigned8	1	W
SOUND_VELOCITY_LINER	P. 104	164	X	X	Simple	O	Float	4	W
LINER_THICKNESS	P. 104	165	X	X	Simple	O	Float	4	W
SOUND_VELOCITY_PIPE_ LONGI	–	166	X	X	Simple	O	Float	4	W
LIQUID	P. 108	167	X	X	Simple	O	Unsigned8	1	W
LIQUID_TEMPERATURE	P. 108	168	X	X	Simple	O	Float	4	W
LIQUID_SOUND_VELOCITY	P. 109	169	X	X	Simple	O	Float	4	W
LIQUID_VISCOSITY	P. 110	170	X	X	Simple	O	Float	4	W
S_VEL_NEG	P. 110	171	X	X	Simple	O	Float	4	W
S_VEL_POS	P. 110	172	X	X	Simple	O	Float	4	W
not used	–	173	–	–	–	–	–	–	–
SYSTEM_FLOW_DAMPING	P. 108	174	X	X	Simple	O	Float	4	W
SYSTEM_ POSITIVE_ZERO_ RETURN	P. 108	175	X	X	Simple	O	Unsigned8	1	N
not used	–	176	–	–	–	–	–	–	–
SENSOR_MEASUREMENT	P. 113	177	X	X	Simple	O	Unsigned8	1	W
SENSOR_TYPE	P. 113	178	X	X	Simple	O	Unsigned8	1	W
SENSOR_CONFIG	P. 114	179	X	X	Simple	O	Unsigned8	1	W
SENSOR_CABLE_LENGTH	P. 114	180	X	X	Simple	O	Unsigned8	1	W
SENSOR_POSITION	P. 114	181	X	–	Simple	O	String	16	N
SENSOR_WIRE_LENGTH	P. 115	182	X	X	Simple	O	Float	4	W
SENSOR_DISTANCE	P. 115	183	X	X	Simple	O	Float	4	W
SENSOR_ARC_LENGTH	P. 115	184	X	X	Simple	O	Float	4	W
SENSOR_PATH_LENGTH	P. 115	185	X	X	Simple	O	Float	4	W
SENSOR_P_FACTOR	P. 115	186	X	X	Simple	O	Float	4	W
SENSOR_ZERO_POINT	P. 115	187	X	X	Simple	O	Float	4	W

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Transducer Block – Slot 1 (shaded grey) = manufacturer-specific parameters									
SENSOR_CORRECTION_ FACTOR	P. 116	188	X	X	Simple	O	Float	4	W
SENSOR_DEV_SENSOR	P. 116	189	X	X	Simple	O	Float	4	W
SENSOR_DEV_ARC_LENGTH	P. 116	190	X	X	Simple	O	Float	4	W
SENSOR_DEV_PATH_LENGTH	P. 116	191	X	X	Simple	O	Float	4	W
SENSOR_REYNOLDS_ NUMBER	–	192	X	X	Simple	O	Float	4	W
SRV_DELTA_T	–	193	X	–	Simple	O	Float	4	N
SRV_ACT_TRANSIT_TIME	–	194	X	–	Simple	O	Float	4	N
SRV_NOM_TRANSIT_TIME	–	195	X	–	Simple	O	Float	4	N
SRV_TIME_FLIGHT_MIN	–	196	X	–	Simple	O	Float	4	N
SRV_TIME_FLIGHT_MAX	–	197	X	–	Simple	O	Float	4	N
SRV_BURST_FREQUENCY	–	198	X	X	Simple	O	Float	4	W
SRV_RCV_FREQUENCY	–	199	X	X	Simple	O	Float	4	W
SRV_REASON_FREQUENCY	–	200	X	X	Simple	O	Float	4	W
SRV_BURST_VOLTAGE	–	201	X	X	Simple	O	Float	4	W
SRV_GAIN_AMP	–	202	X	X	Simple	O	Float	4	W
SRV_STATUS_AMP	–	203	X	X	Simple	O	Float	4	W
not used	–	204	–	–	–	–	–	–	–
DIAG_ALARM_DELAY	P. 136	205	X	X	Simple	O	Float	4	W
SYSTEM_RESET	P. 136	206	X	X	Simple	O	Unsigned8	1	N
not used	–	207	–	–	–	–	–	–	–
SIM_MEASURAND	P. 138	208	X	X	Simple	O	Unsigned8	1	N
SIM_VALUE	P. 138	209	X	X	Simple	O	Float	4	N
SIM_FSAFE_MODE	P. 139	210	X	X	Simple	O	Unsigned8	1	N
not used	–	211–216	–	–	–	–	–	–	–
DISP_SOUND_VELO_PIPE	–	217	X	–	Simple	O	Float	4	N
STORE_SOUND_VELO_PIPE	–	218	X	X	Simple	O	Unsigned8	1	N
DISP_WALL_THCKNESS	–	219	X	–	Simple	O	Float	4	N
STORE_WALL_THCKNESS	–	220	X	X	Simple	O	Unsigned8	1	N
DISP_SOUND_VELO_LIQUID	–	221	X	–	Simple	O	Float	4	N
STORE_SOUND_VELO_LIQUID	–	222	X	X	Simple	O	Unsigned8	1	N
DELTA_SENS_POS_1	–	223	X	X	X	O	Float	4	S
not used	–	224–226	–	–	–	–	–	–	–
VIEW	–	227	X	–	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D
not used	–	228 - 230	–	–	–	–	–	–	–

6.5 Transducer Block 2 – Slot 2

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Transducer Block 2 – Slot 2 (shaded grey) = manufacturer-specific parameters									
TB2_BLOCK_OBJECT	–	70	X	–	Record	M	DS-32	20	C
TB2_ST_REV	P. 146	71	X	–	Simple	M	Unsigned16	2	N
TB2_TAG_DESC	P. 146	72	X	X	Simple	M	OctetString	32	W
TB2_STRATEGY	P. 146	73	X	X	Simple	M	Unsigned16	2	W
TB2_ALERT_KEY	P. 147	74	X	X	Simple	M	Unsigned8	1	W
TB2_TARGET_MODE	P. 145	75	X	X	Simple	M	Unsigned8	1	W
TB2_MODE_BLK	–	76	X	–	Record	M	DS-37	3	D
TB2_ALARM_SUM	P. 146	77	X	–	Record	M	DS-42	8	D
TB2_CALIBR_FACTOR	P. 144	78	X	X	Simple	M	Float	4	W
TB2_LOW_FLOW_CUTOFF	P. 143	79	X	X	Simple	M	Float	4	W
TB2_MEASUREMENT_MODE	P. 143	80	X	X	Simple	M	Unsigned8	1	W
TB2_FLOW_DIRECTION	P. 143	81	X	X	Simple	M	Unsigned8	1	W
TB2_ZERO_POINT	P. 144	82	X	X	Simple	M	Float	4	W
TB2_ZERO_POINT_ADJUST	P. 144	83	X	X	Simple	M	Unsigned8	1	N
TB2_ZERO_POINT_UNIT	P. 144	84	X	X	Simple	M	Unsigned16	2	W
TB2_NOMINAL_SIZE	P. 144	85	X	X	Simple	M	Float	4	W
TB2_NOMINAL_SIZE_UNITS	P. 144	86	X	X	Simple	M	Unsigned16	2	W
TB2_VOLUME_FLOW	P. 92 / P. 142	87	X	–	Record	M	DS-33	5	D
TB2_VOLUME_FLOW_UNITS	P. 94 / P. 142	88	X	X	Simple	M	Unsigned16	2	W
TB2_VOLUME_FLOW_LO_LIMIT	P. 142	89	X	X	Simple	M	Float	4	W
TB2_VOLUME_FLOW_HI_LIMIT	P. 142	90	X	X	Simple	M	Float	4	W
not used	–	91–106	–	–	–	–	–	–	–
TB2_SOUND_VELOCITY	P. 92 / P. 142	107	X	–	Record	M	DS-33	5	D
TB2_SOUND_VELOCITY_UNITS	P. 94 / P. 143	108	X	X	Simple	M	Unsigned16	2	W
TB2_SOUND_VELOCITY_ LO_LIMIT	P. 143	109	X	X	Simple	M	Float	4	W
TB2_SOUND_VELOCITY_HI_ LIMIT	P. 143	110	X	X	Simple	M	Float	4	W
not used	–	111–122	–	–	–	–	–	–	–
TB2_FLOW_VELOCITY	P. 92	123	X	–	Record	O	DS-33	5	D
TB2_SIGNALSTRENGTH	P. 92	124	X	–	Simple	O	Float	4	N
TB2_VOLUME_FLOW_AVG	P. 93	125	X	–	Record	O	DS-33	5	D
TB2_VOLUME_FLOW_SUM	P. 93	126	X	–	Record	O	DS-33	5	D
TB2_VOLUME_FLOW_DIFF	P. 93	127	X	–	Record	O	DS-33	5	D
TB2_SOUND_VELOCITY_AVG	P. 93	128	X	–	Record	O	DS-33	5	D
TB2_FLOW_VELOCITY_AVG	P. 93	129	X	–	Record	O	DS-33	5	D
not used	–	130–150	–	–	–	–	–	–	–
TB2_LOW_FLOW_CUTOFF_ ASSIGN	P. 97	151	X	X	Simple	O	Unsigned8	1	W
TB2_LOW_FLOW_CUTOFF_ OFF_VALUE	P. 97	152	X	X	Simple	O	Float	4	W

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Transducer Block 2 – Slot 2 (shaded grey) = manufacturer-specific parameters									
TB2_SYSTEM_PRESSURE_SHOCK_SUPPRES	P. 98	153	X	X	Simple	O	Float	4	W
not used	–	154	–	–	–	–	–	–	–
TB2_PIPE_STANDARD	P. 99	155	X	X	Simple	O	Unsigned8	1	W
TB2_NOMINAL_DIAMETER	P. 99	156	X	X	Simple	O	Unsigned8	1	W
TB2_PIPE_MATERIAL	P. 100	157	X	X	Simple	O	Unsigned8	1	W
TB2_REFERENCE_VALUE	P. 100	158	X	X	Simple	O	Float	4	W
TB2_SOUND_VELOCITY_PIPE	P. 101	159	X	X	Simple	O	Float	4	W
TB2_CIRCUMFERENCE	P. 101	160	X	X	Simple	O	Float	4	N
TB2_PIPE_DIAMETER	P. 102	161	X	X	Simple	O	Float	4	N
TB2_WALL_THICKNESS	P. 102	162	X	X	Simple	O	Float	4	N
TB2_LINER_MATERIAL	P. 103	163	X	X	Simple	O	Unsigned8	1	W
TB2_SOUND_VELOCITY_LINER	P. 104	164	X	X	Simple	O	Float	4	W
TB2_LINER_THICKNESS	P. 104	165	X	X	Simple	O	Float	4	W
TB2_SOUND_VELOCITY_PIPE_LONGI	–	166	X	X	Simple	O	Float	4	W
TB2_LIQUID	P. 108	167	X	X	Simple	O	Unsigned8	1	W
TB2_LIQUID_TEMPERATURE	P. 108	168	X	X	Simple	O	Float	4	W
TB2_LIQUID_SOUND_VELOCITY	P. 109	169	X	X	Simple	O	Float	4	W
TB2_LIQUID_VISCOSITY	P. 110	170	X	X	Simple	O	Float	4	W
TB2_S_VEL_NEG	P. 110	171	X	X	Simple	O	Float	4	W
TB2_S_VEL_POS	P. 110	172	X	X	Simple	O	Float	4	W
not used	–	173	–	–	–	–	–	–	–
TB2_SYSTEM_FLOW_DAMPING	P. 108	174	X	X	Simple	O	Float	4	W
TB2_SYSTEM_POSITIVE_ZERO_RETURN	P. 108	175	X	X	Simple	O	Unsigned8	1	N
not used	–	176	–	–	–	–	–	–	–
TB2_SENSOR_MEASUREMENT	P. 113	177	X	X	Simple	O	Unsigned8	1	W
TB2_SENSOR_TYPE	P. 113	178	X	X	Simple	O	Unsigned8	1	W
TB2_SENSOR_CONFIG	P. 114	179	X	X	Simple	O	Unsigned8	1	W
TB2_SENSOR_CABLE_LENGTH	P. 114	180	X	X	Simple	O	Unsigned8	1	W
TB2_SENSOR_POSITION	P. 114	181	X	–	Simple	O	String	16	N
TB2_SENSOR_WIRE_LENGTH	P. 115	182	X	X	Simple	O	Float	4	W
TB2_SENSOR_DISTANCE	P. 115	183	X	X	Simple	O	Float	4	W
TB2_SENSOR_ARC_LENGTH	P. 115	184	X	X	Simple	O	Float	4	W
TB2_SENSOR_PATH_LENGTH	P. 115	185	X	X	Simple	O	Float	4	W
TB2_SENSOR_P_FACTOR	P. 115	186	X	X	Simple	O	Float	4	W
TB2_SENSOR_ZERO_POINT	P. 115	187	X	X	Simple	O	Float	4	W
TB2_SENSOR_CORRECTION_FACTOR	P. 116	188	X	X	Simple	O	Float	4	W
TB2_SENSOR_DEV_SENSOR	P. 116	189	X	X	Simple	O	Float	4	W
TB2_SENSOR_DEV_ARC_LENGTH	P. 116	190	X	X	Simple	O	Float	4	W
TB2_SENSOR_DEV_PATH_LENGTH	P. 116	191	X	X	Simple	O	Float	4	W
TB2_SENSOR_REYNOLDS_NUMBER	–	192	X	X	Simple	O	Float	4	W
TB2_SRV_DELTA_T	–	193	X	–	Simple	O	Float	4	N

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Transducer Block 2 – Slot 2 (shaded grey) = manufacturer-specific parameters									
TB2_SRV_ACT_TRANSIT_TIME	–	194	X	–	Simple	O	Float	4	N
TB2_SRV_NOM_TRANSIT_TIME	–	195	X	–	Simple	O	Float	4	N
TB2_SRV_TIME_FLIGHT_MIN	–	196	X	–	Simple	O	Float	4	N
TB2_SRV_TIME_FLIGHT_MAX	–	197	X	–	Simple	O	Float	4	N
TB2_SRV_BURST_FREQUENCY	–	198	X	X	Simple	O	Float	4	W
TB2_SRV_RCV_FREQUENCY	–	199	X	X	Simple	O	Float	4	W
TB2_SRV_REASON_FREQUENCY	–	200	X	X	Simple	O	Float	4	W
TB2_SRV_BURST_VOLTAGE	–	201	X	X	Simple	O	Float	4	W
TB2_SRV_GAIN_AMP	–	202	X	X	Simple	O	Float	4	W
TB2_SRV_STATUS_AMP	–	203	X	X	Simple	O	Float	4	W
not used	–	204–207	–	–	–	–	–	–	–
TB2_SIM_MEASURAND	P. 139	208	X	X	Simple	O	Unsigned8	1	N
TB2_SIM_VALUE	P. 140	209	X	X	Simple	O	Float	4	N
not used	–	210	–	–	–	–	–	–	–
TB2_DISP_SOUND_VELO_PIPE	–	211	X	–	Simple	O	Float	4	N
TB2_STORE_SOUND_VELO_PIPE	–	212	X	X	Simple	O	Unsigned8	1	N
TB2_DISP_WALL_THCKNESS	–	213	X		Simple	O	Float	4	N
TB2_STORE_WALL_THCKNESS	–	214	X	X	Simple	O	Unsigned8	1	N
TB2_DISP_SOUND_VELO_LIQUID	–	215	X	–	Simple	O	Float	4	N
TB2_STORE_SOUND_VELO_ LIQUID	–	216	X	X	Simple	O	Unsigned8	1	N
TB2_DELTA_SENS_POS_2	–	217	X	X	X	O	Float	4	S
TB2_VIEW	–	218	X	–	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D
not used	–	219–220	–	–	–	–	–	–	–

6.6 AI 1 – Volume Flow Block CH1 – Slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 1 – Volume Flow CH1 Block – Slot 1									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	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	–	–	–	–	–	–	–

6.7 AI 2 – Sound Velocity CH1 Block – Slot 2

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 2 – Sound Velocity CH1 Block – Slot 2									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	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	–	–	–	–	–	–	–

6.8 AI 3 – Flow Velocity CH1 Block – Slot 3

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 3 – Flow Velocity CH1 Block – Slot 3									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	51	X	X	Simple	O	Octet String	16	W
not used	–	52–60	–	–	–	–	–	–	–
AI3_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI3	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.9 AI 4 – Volume Flow CH2 – Slot 4

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 4 – Volume Flow CH2 – Slot 4									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	51	X	X	Simple	O	Octet String	16	W
not used	–	52–60	–	–	–	–	–	–	–
AI4_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI4	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.10 AI 5 – Sound Velocity CH2 Block – Slot 5

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 5 – Sound Velocity CH2 Block – Slot 5									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	51	X	X	Simple	O	Octet String	16	W
not used	–	52–60	–	–	–	–	–	–	–
AI5_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI5	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.11 AI 6 – Flow Velocity CH2 Block – Slot 6

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 6 – Flow Velocity CH2 Block – Slot 6									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	51	X	X	Simple	O	Octet String	16	W
not used	–	52–60	–	–	–	–	–	–	–
AI6_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI6	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.12 AI 7 – Volume Flow Average Block – Slot 7

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 7 – Volume Flow Average Block – Slot 7									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	51	X	X	Simple	O	Octet String	16	W
not used	–	52–60	–	–	–	–	–	–	–
AI7_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI7	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.13 AI 8 – Sound Velocity Average Block – Slot 8

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
AI 8 – Sound Velocity Average Block – Slot 8									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 162	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 162	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 162	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 162	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 160	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 160	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 161	23	X	–	Record	M	DS-42	8	D
BATCH	P. 163	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
OUT	P. 153	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 154	27	X	X	Array	M	Float	8	W
OUT_SCALE	P. 155	28	X	X	Record	M	DS-36	11	W
LIN_TYPE	P. 154	29	X	X	Simple	M	Unsigned 8	1	W
CHANNEL	P. 161	30	X	X	Simple	M	Unsigned16	2	W
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 156	32	X	X	Simple	M	Float	4	W
FSAFE_TYPE	P. 154	33	X	X	Simple	O	Unsigned 8	1	W
FSAFE_VALUE	P. 154	34	X	X	Simple	O	Float	4	W
ALARM_HYS	P. 157	35	X	X	Simple	M	Float	4	W
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 158	37	X	X	Simple	M	Float	4	W
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 158	39	X	X	Simple	M	Float	4	W
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 159	41	X	X	Simple	M	Float	4	W
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 159	43	X	X	Simple	M	Float	4	W
not used	–	44–45	–	–	–	–	–	–	–
HI_HI_ALM	P. 158	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 158	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 159	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 159	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 160	50	X	X	Record	O	DS-50	6	W
OUT_UNIT_TEXT	P. 155	51	X	X	Simple	O	Octet String	16	W
not used	–	52–60	–	–	–	–	–	–	–
AI8_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI8	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.14 Totalizer 1 Block – Slot 9

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Totalizer 1 Block - Slot 9									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	Cst
ST_REV	P. 175	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 176	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 176	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 176	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 174	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 174	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 175	23	X	–	Record	M	DS-42	8	D
BATCH	P. 176	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
TOTAL	P. 168	26	X	–	Record	M	DS-33	5	N
UNIT_TOT	P. 169	27	X	X	Simple	M	Unsigned16	2	W
CHANNEL	P. 174	28	X	X	Simple	M	Unsigned16	2	W
SET_TOT	P. 169	29	X	X	Simple	M	Unsigned 8	1	N
MODE_TOT	P. 170	30	X	X	Simple	M	Unsigned 8	1	N
FAIL_TOT	P. 169	31	X	X	Simple	M	Unsigned 8	1	W
PRESET_TOT	P. 169	32	X	X	Simple	M	Float	4	W
ALARM_HYS	P. 171	33	X	X	Simple	M	Float	4	W
HI_HI_LIM	P. 172	34	X	X	Simple	M	Float	4	W
HI_LIM	P. 172	35	X	X	Simple	M	Float	4	W
LO_LIM	P. 173	36	X	X	Simple	M	Float	4	W
LO_LO_LIM	P. 173	37	X	X	Simple	M	Float	4	W
HI_HI_ALM	P. 172	38	X	–	Record	O	DS-39	16	D
HI_ALM	P. 172	39	X	–	Record	O	DS-39	16	D
LO_ALM	P. 173	40	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 173	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

6.15 Totalizer 2 Block – Slot 10

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Totalizer 2 Block - Slot 10									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	Cst
ST_REV	P. 175	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 176	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 176	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 176	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 174	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 174	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 175	23	X	–	Record	M	DS-42	8	D
BATCH	P. 176	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
TOTAL	P. 168	26	X	–	Record	M	DS-33	5	N
UNIT_TOT	P. 169	27	X	X	Simple	M	Unsigned16	2	W
CHANNEL	P. 174	28	X	X	Simple	M	Unsigned16	2	W
SET_TOT	P. 169	29	X	X	Simple	M	Unsigned 8	1	N
MODE_TOT	P. 170	30	X	X	Simple	M	Unsigned 8	1	N
FAIL_TOT	P. 169	31	X	X	Simple	M	Unsigned 8	1	W
PRESET_TOT	P. 169	32	X	X	Simple	M	Float	4	W
ALARM_HYS	P. 171	33	X	X	Simple	M	Float	4	W
HI_HI_LIM	P. 172	34	X	X	Simple	M	Float	4	W
HI_LIM	P. 172	35	X	X	Simple	M	Float	4	W
LO_LIM	P. 173	36	X	X	Simple	M	Float	4	W
LO_LO_LIM	P. 173	37	X	X	Simple	M	Float	4	W
HI_HI_ALM	P. 172	38	X	–	Record	O	DS-39	16	D
HI_ALM	P. 172	39	X	–	Record	O	DS-39	16	D
LO_ALM	P. 173	40	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 173	41	X	–	Record	O	DS-39	16	D
not used	–	42–51	–	–	–	–	–	–	–
TOT2_TYPE	–	52	X		Simple	O	Unsigned16	2	Cst
OVERFLOW	–	53	X	X	Simple	O	Unsigned16	2	N
VIEW_TOT2	–	54	X		Record	M	Unsigned16, DS-37, DS-42, DS-33	18	D

6.16 Totalizer 3 Block – Slot 11

Name	E+H Matrix	Index	Read	Write	Object Type	Parameters	Data Type	Byte Size	Storage Class
Totalizer 3 Block - Slot 11									
not used	–	0–15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	Cst
ST_REV	P. 175	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 176	18	X	X	Simple	M	Octet String	32	W
STRATEGY	P. 176	19	X	X	Simple	M	Unsigned16	2	W
ALERT_KEY	P. 176	20	X	X	Simple	M	Unsigned 8	1	W
TARGET_MODE	P. 174	21	X	X	Simple	M	Unsigned 8	1	W
MODE_BLK	P. 174	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 175	23	X	–	Record	M	DS-42	8	D
BATCH	P. 176	24	X	X	Record	M	DS -67	10	W
not used	–	25	–	–	–	–	–	–	–
TOTAL	P. 168	26	X	–	Record	M	DS-33	5	N
UNIT_TOT	P. 169	27	X	X	Simple	M	Unsigned16	2	W
CHANNEL	P. 174	28	X	X	Simple	M	Unsigned16	2	W
SET_TOT	P. 169	29	X	X	Simple	M	Unsigned 8	1	N
MODE_TOT	P. 170	30	X	X	Simple	M	Unsigned 8	1	N
FAIL_TOT	P. 169	31	X	X	Simple	M	Unsigned 8	1	W
PRESET_TOT	P. 169	32	X	X	Simple	M	Float	4	W
ALARM_HYS	P. 171	33	X	X	Simple	M	Float	4	W
HI_HI_LIM	P. 172	34	X	X	Simple	M	Float	4	W
HI_LIM	P. 172	35	X	X	Simple	M	Float	4	W
LO_LIM	P. 173	36	X	X	Simple	M	Float	4	W
LO_LO_LIM	P. 173	37	X	X	Simple	M	Float	4	W
HI_HI_ALM	P. 172	38	X	–	Record	O	DS-39	16	D
HI_ALM	P. 172	39	X	–	Record	O	DS-39	16	D
LO_ALM	P. 173	40	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 173	41	X	–	Record	O	DS-39	16	D
not used	–	42–51	–	–	–	–	–	–	–
TOT3_TYPE	–	52	X		Simple	O	Unsigned16	2	Cst
OVERFLOW	–	53	X	X	Simple	O	Unsigned16	2	N
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