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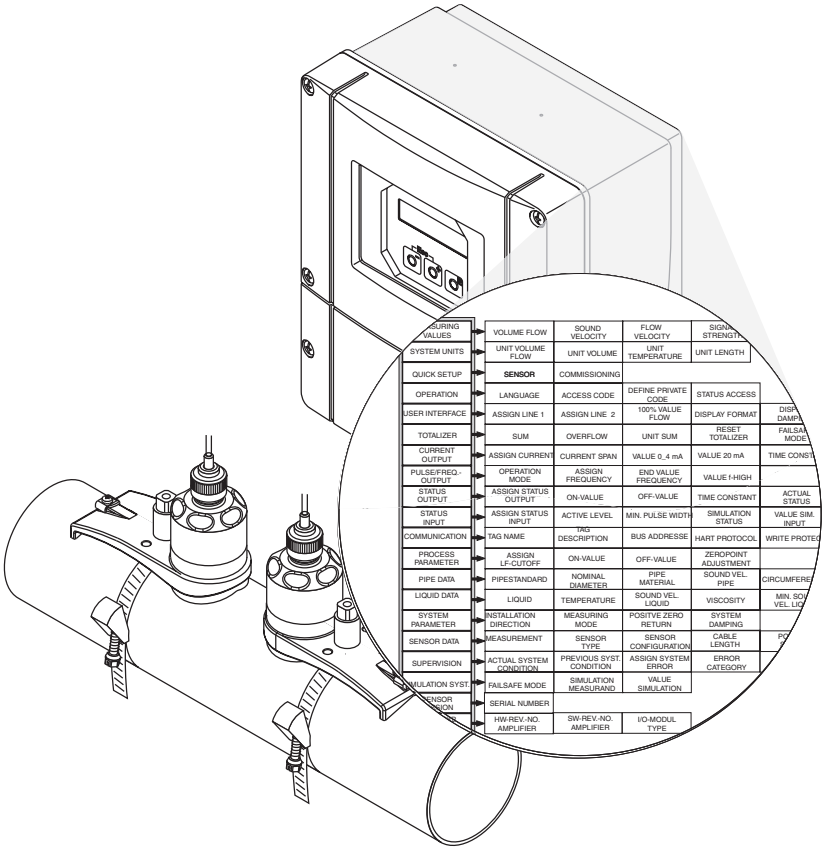
Description of Device Functions

Proline Prosonic Flow 90 (PROFIBUS PA)

Ultrasonic Flow Measuring System

PROFIBUS PROCESS FIELD BUS



BA 075D/06/en/11.04
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Valid as of version:
V 2.03.XX (Device software)

Endress+Hauser

People for Process Automation

Operation of Prosonic Flow 90 PROFIBUS-PA

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PROFIBUS®
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Table of contents for local operation

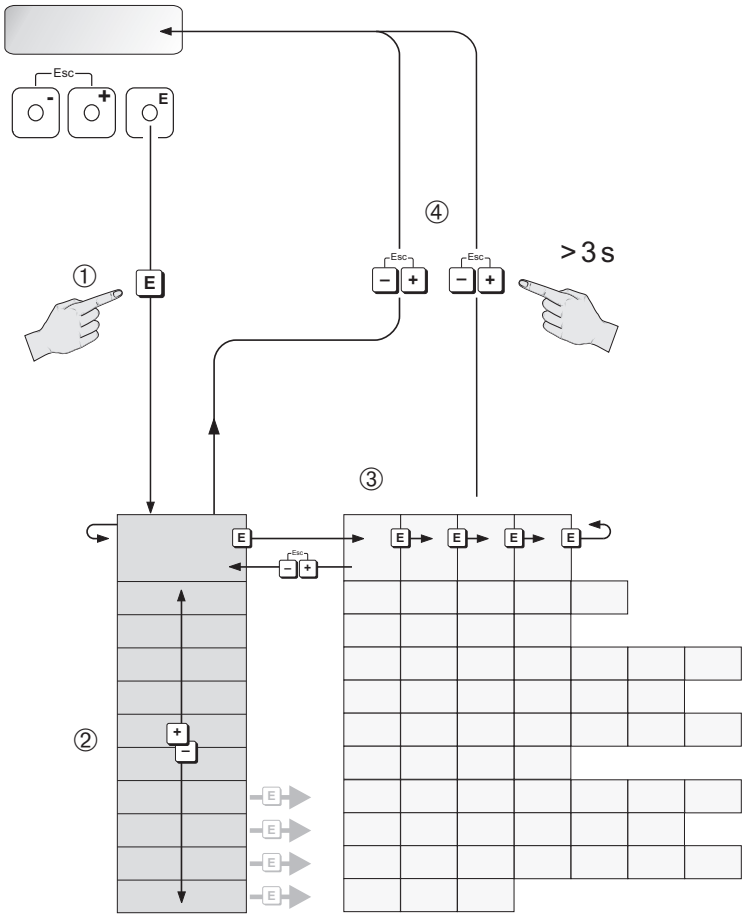
1 Function matrix

1.1 The function matrix: layout and use

The function matrix is a two-level construct: the groups form one level and the groups' functions the other.
The groups are the “highest-level grouping” of the operating options for the measuring device.
A number of functions is assigned to each group.
You select a group in order to access the individual functions for controlling and parameterising the measuring device.

You will find an overview of all the groups available in the table of contents on Page 5 and in the graphical representation of the function matrix on Page 8.
You will also find an overview of all the functions available on Page 8, complete with page references to the detailed function descriptions.
The descriptions of the individual functions start on Page 9.

Example of how to parameterise a function (in this case changing the language for the user interface):
① Entry into the function matrix (E key).
② Select the OPERATION group.
③ Select the LANGUAGE function and then change the option from ENGLISH to DEUTSCH (±) and save (E).
All text on the display now appears in German.
④ Exit the function ④ Verlassen der Funktionsmatrix (Esc > 3 Sekunden).



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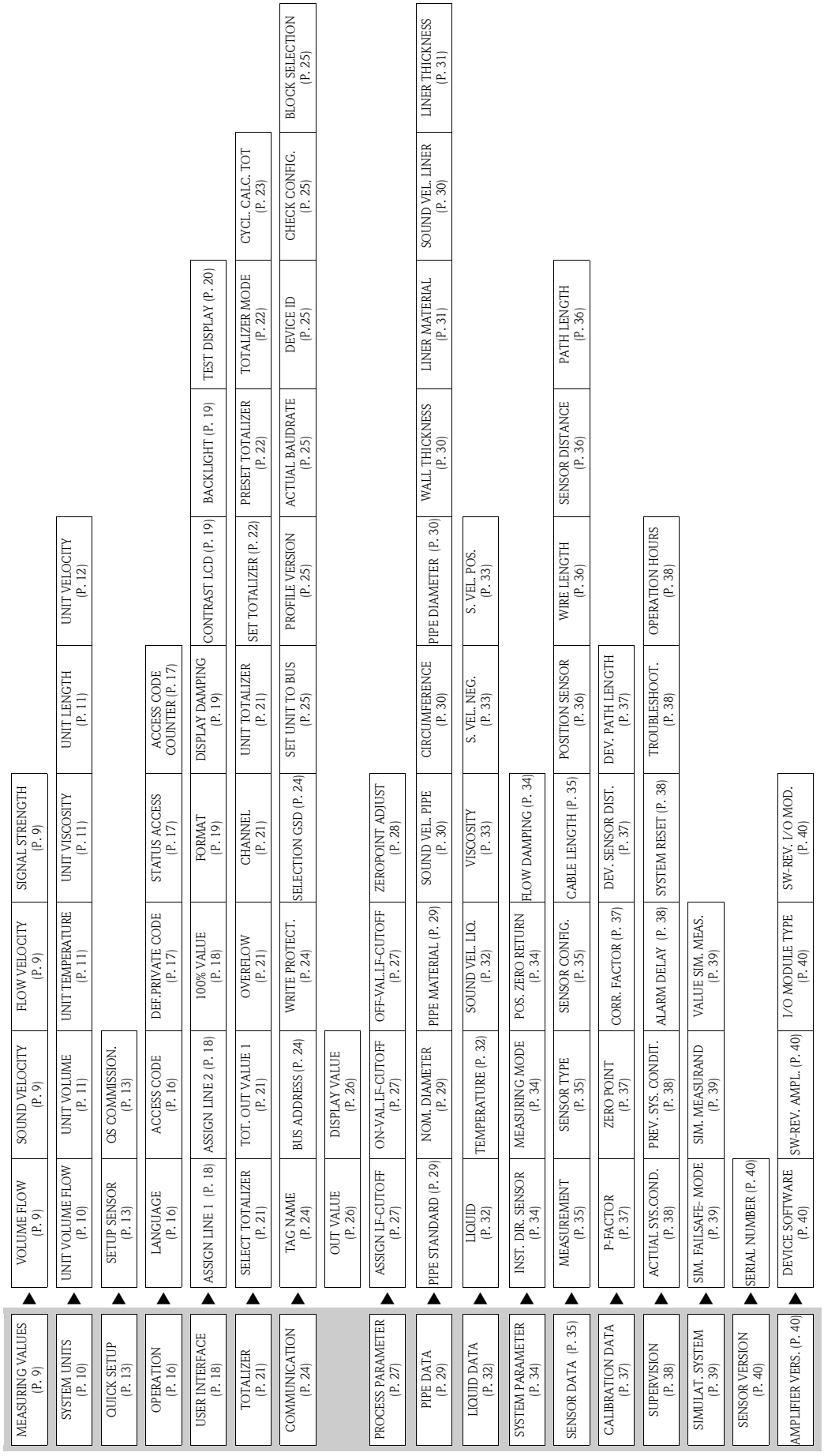
1.2 Overview of the function matrix



2 Group MEASURING VALUES

MEASURING VALUES function description	
✎ Note! ■ The engineering unit of the measured variable displayed here can be set in the SYSTEM UNITS group (see Page 10). ■ If the fluid in the pipe flows backwards, a negative sign prefixes the flow reading on the display.	
VOLUME FLOW	Displays the volume flow. **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	Displays the sound velocity currently measured in the liquid. **Display:** 5-digit fixed-point number, including unit (e.g. 1400.0 m/s, 5249.3 ft/s)
FLOW VELOCITY	Displays the flow velocity currently measured. **Display:** 5-digit floating-point number, including unit and sign (e.g. 8.0000 m/s, 26.247 ft/s)
SIGNAL STRENGTH	Displays the signal strength. **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 Group SYSTEM UNITS

SYSTEM UNITS function description	
Use this function group to select the unit for the measured variable.	
UNIT VOLUME FLOW	Use this function to select the unit intended for the volume flow. The unit you select here is also valid for: ■ Switch points (limit value for volume flow, flow direction) ■ Low flow cut off ✎ Note! The following units of time can be selected: s = second, m = minute, h = hour, d = day **Options:** Metric (... = unit of time, see note): Cubic centimetre → cm^3/... Cubic decimetre → dm^3/... Cubic metre → m^3/... Millilitre → ml/... Litre → l/... Hectolitre → hl/... Megalitre → Ml/... MEGA US (... = unit of time, see note): 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 (... = unit of time, see note): 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

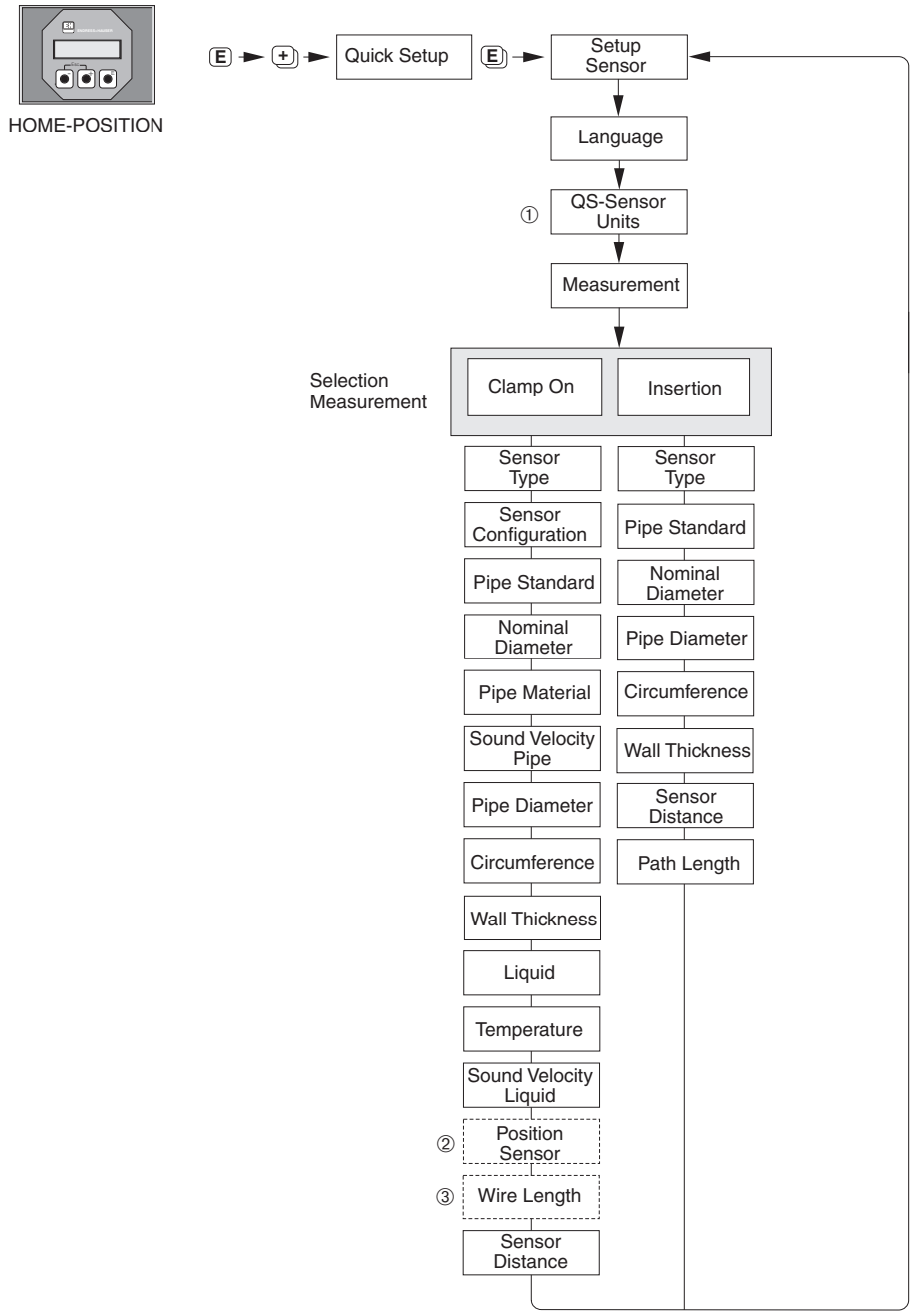
SYSTEM UNITS function description	
UNIT VOLUME	Use this function to select the unit for displaying the volume. **Options:** Metric → cm^3; dm^3; m^3; ml; l; hl; Ml US → cc; af; ft^3; oz f; gal; Mgal; bbl (normal fluids); bbl (beer); bbl (petrochemicals); bbl (filling tanks) Imperial → gal; Mgal; bbl (beer); bbl (petrochemicals) **Factory setting:** l ✎ 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 for local operation, i.e. it is not used by the measuring system for further processing of measured variables.
UNIT TEMPERATURE	Use this function to select the unit for the fluid temperature. ✎ Note! The fluid temperature is entered in the TEMPERATURE function (see Page 32). **Options:** °C (Celsius) K (Kelvin) °F (Fahrenheit) R (Rankine) **Factory setting:** °C
UNIT VISCOSITY	Use this function to select the unit for the fluid viscosity. **Options:** mm^2/s cSt St **Factory setting:** mm^2/s
UNIT LENGTH	Use this function to select the unit for the measure of length. The unit you select here is valid for: ■ Pipe circumference ■ Pipe diameter ■ Wall thickness ■ Wire length ■ Sensor distance ■ Path length ■ Sensor distance deviation ■ Path length deviation **Options:** MILLIMETER INCH **Factory setting:** MILLIMETER

SYSTEM UNITS function description	
UNIT VELOCITY	Use this function to select the unit for velocity. The unit you select here is valid for: ■ Sound velocity ■ Flow velocity **Options:** m/s ft/s **Factory setting:** m/s

4 Group QUICK SETUP

QUICK SETUP function description	
SETUP SENSOR	Use this function to start the Quick Setup menu for assembling the ultrasonic sensors. **Options:** YES NO **Factory setting:** NO ✎ Note! You will find a flowchart of the SETUP SENSOR menu on Page 14. More detailed information on Quick Setups is provided in the related Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA074D/06/en.
QUICK SETUP COMMISSIONING	Use this function to start the Quick Setup menu for commissioning. **Options:** YES NO **Factory setting:** NO ✎ Note! You will find a flowchart of the QUICK SETUP COMMISSIONING menu on Page 15. More detailed information on Quick Setups is provided in the related Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA074D/06/en.

4.1 Quick Setup “Sensor Installation”



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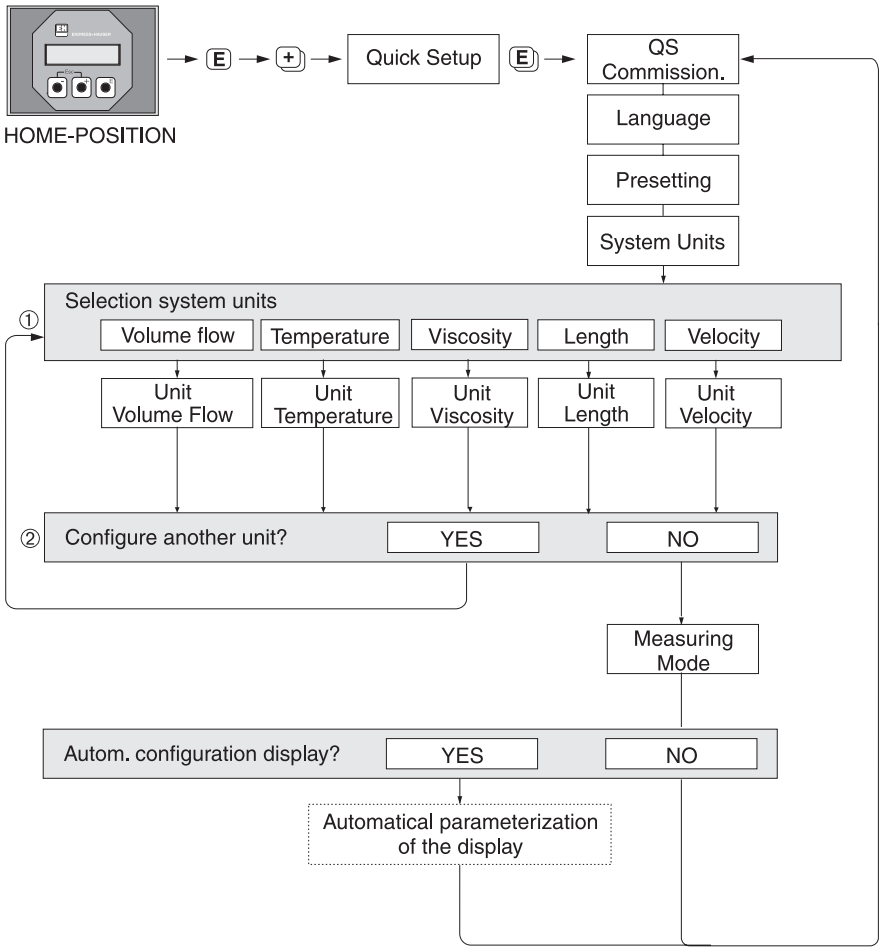
Note!
The display returns to the COMMISSIONING QUICK SETUP function cell if you press the ESC key (− + E) during parameter interrogation.

① Selection of the system units only influences the functions UNIT TEMPERATURE, UNIT LENGTH and UNIT VELOCITY.

② The POSITION SENSOR function only appears when the CLAMP ON option is set in the MEASUREMENT function and the number of traverses is 2 or 4 in the SENSOR CONFIGURATION function.

③ The WIRE LENGTH function only appears when the CLAMP ON option is set in the MEASUREMENT function and the number of traverses is 1 or 3 in the SENSOR CONFIGURATION function.

4.2 Quick Setup “Commissioning”



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Note!
The display returns to the COMMISSIONING QUICK SETUP function cell if you press the ESC key (− + Esc) during parameter interrogation.

① Only the units not yet configured in the current Quick Setup are offered for selection in each cycle.

② The “YES” option remains visible until all the units have been parameterised. “NO” is the only option displayed when no further units are available.

5 Group OPERATION

OPERATION function description	
LANGUAGE	Use this function to select the language for all texts, parameters and messages shown on the local display. ✎ Note! The displayed options depend on the available language group shown in the LANGUAGE GROUP function. **Options:** Language group WEST EU / USA: ENGLISH, DEUTSCH, FRANCAIS, ESPANOL, ITALIANO, NEDERLANDS, PORTUGUESE Language group EAST EU / SCAND.: ENGLISH, NORSK, SVENSKA, SUOMI, POLISH, CZECH, RUSSIAN Language group ASIA: ENGLISH, BAHASA INDONESIA, JAPANESE (syllabary) Language group CHINESE: CHINESE, ENGLISH **Factory setting:** Country-dependent ✎ Note! ■ If you press the ⊡ keys simultaneously during startup, the language defaults to "ENGLISH". ■ You can change the language group via the configuration software Fieldtool. Please do not hesitate to contact your Endress+Hauser sales office if you have any questions.
ACCESS CODE	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 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 the private code (**factory setting = 90**, see the DEFINE PRIVATE CODE function). **User input:** Max. 4-digit number: 0...9999 ✎ Note! ■ The programming levels are disabled if you do not press a key within 60 seconds following automatic return to the HOME position. ■ You can also disable programming in this function by entering any number (other than the defined private code). ■ The Endress+Hauser service organisation can be of assistance if you mislay your private code.

OPERATION function description	
DEFINE PRIVATE CODE	Use this function to define a private code for enabling programming. **User input:** Max. 4-digit number: 0...9999 **Factory setting:** 90 ✎ Note! ■ Programming is always enabled if the code defined = “0”. ■ Programming has to be enabled before this code can be changed. When programming is disabled this function cannot be edited. This precaution prevents others from accessing your private code
STATUS ACCESS	Displays the access status of the function matrix. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)
ACCESS CODE COUNTER	The number of times the private or service code was entered to access the device appears on the display. **Display:** Integer (delivery status: 0)

6 Group USER INTERFACE

USER INTERFACE function description	
ASSIGN LINE 1	Use this function to define which display value is assigned to the main line (top line of the local display). This value is displayed during normal operation. **Options:** OFF VOLUME FLOW VOLUME FLOW IN % SOUND VELOCITY FLOW VELOCITY AI1 - OUT VALUE AI2 - OUT VALUE AI3 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1 **Factory setting:** VOLUME FLOW ✎ Note! If the option PROFILE-GSD was selected in the SELECTION GSD function (see Page 24) the options AI3 - OUT VALUE and A0 - DISP. VALUE are **not** available in this function
ASSIGN LINE 2	Use this function to define which display value is assigned to the additional line (bottom line of the local display). This value is displayed during normal operation. **Options:** OFF VOLUME FLOW VOLUME FLOW IN % SOUND VELOCITY FLOW VELOCITY OPERATING/SYSTEM CONDITION DISPLAY FLOW DIRECTION VOLUME FLOW BARGRAPH IN % SIGNAL STRENGTH BARGRAPH AI1 - OUT VALUE AI2 - OUT VALUE AI3 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1 TAG NAME **Factory setting:** VOLUME FLOW IN %
100% VALUE	Use this function to define the flow value which should be shown on the display as the 100% value. ✎ Note! This function is not available unless the option VOLUME FLOW IN % or VOLUME FLOW BARGRAPH IN % was selected in the ASSIGN LINE 1 or ASSIGN LINE 2 function. **User input:** 5-digit floating-point number, including unit and sign **Factory setting:** 10.000 l/s

USER INTERFACE function description	
FORMAT	Use this function to define the maximum number of places after the decimal point displayed for the reading in the main line. **Options:** XXXXX. - XXXX.X - XXX.XX - XX.XXX -X.XXXX **Factory setting:** X.XXXX ✎ Note! ■ Note that this setting only affects the reading as it appears on the display, it has no influence on the accuracy of the system's calculations. ■ The places after the decimal point as computed by the measuring device cannot always be displayed, depending on this setting and the engineering unit. In these instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.
DISPLAY DAMPING	Use this function to enter a time constant defining how the display reacts to severely fluctuating flow variables, either very quickly (enter a low time constant) or with damping (enter a high time constant). **User input:** 0...100 s **Factory setting:** 1 s ✎ Note! The damping is switched off if the setting is “0 s”.
CONTRAST LCD	Use this function to optimise the display contrast to suit local operating conditions. **User input:** 10...100% **Factory setting:** 50%
BACKLIGHT	Use this function to optimize the backlight to suit local operating conditions. **User input:** 10...100% **Factory setting:** 50%

USER INTERFACE function description	
TEST DISPLAY	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 and additional line are darkened for minimum 0.75 seconds. 3. The main line and additional line show an “8” in each field for minimum 0.75 seconds. 4. The main line and additional line show a “0” in each field for minimum 0.75 seconds. 5. The main line and additional line show nothing (blank display) for minimum 0.75 seconds. 6. When the test is completed, the local display returns to its initial state and the setting changes to OFF.

7 Group TOTALIZER

TOTALIZER function description	
SELECT TOTALIZER	Use this function to select a totalizer. ✎ Note! Only one totalizer is available to Proline Prosonic Flow 90 PROFIBUS PA. **Display:** TOTALIZER 1 **Factory setting:** TOTALIZER 1
TOT. OUT VALUE 1	Use this function to view the TOTAL (output) measured value of the totalizer including the unit.
OVERFLOW	The total for the totalizer's overflow aggregated since measuring commenced appears on the display. The total flow rate 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 function plus the value returned by the TOT. OUT VALUE 1 function. **Example:** Reading for 2 overflows: 2 E7 (= 20,000,000 [unit]) Value displayed in the TOT. OUT VALUE 1 function: 196'845.7 [unit] Effective total quantity = 20,196,845.7 [unit] **Display:** Integer with exponent, including sign, e.g. 2 E7
CHANNEL	Use this function to assign a measured variable to the totalizer. **Options:** OFF VOLUME FLOW **Factory setting:** VOLUME FLOW
UNIT TOTALIZER	Use this function to define the unit for the totalizer measured variable selected previously. **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

TOTALIZER function description	
SET TOTALIZER	Use this function to assign a status to the totalizer. **Options:** TOTALIZE Total the measured variable selected in the CHANNEL function. RESET Reset the totalizer to zero. PRESET Set the totalizer to the value defined in the PRESET TOTALIZER function. ✎ Note! Note that selecting RESET or PRESET resets the totalizer to "0" or 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 function. **Factory setting:** TOTALIZE
PRESET TOTALIZER	Use this function to define a start value for the totalizer. ✎ Note! The totalizer does not accept this value unless the PRESET option was selected beforehand in the SET TOTALIZER function. **User input:** –99999...99999 **Factory setting:** 0
TOTALIZER MODE	Use this function to define how the totalizer totals the flow components. **Options:** BALANCE The positive and negative flow components are balanced. In other words, net flow in the flow direction is registered. POSITIVE Only positive flow components are totalled. NEGATIVE Only negative flow components are totalled. HOLD VALUE The totalizer stops at the last value. No further flow components are totalled. **Factory setting:** BALANCE

TOTALIZER function description	
CYCL. CALC. TOT	Use this function to define whether the totalizer is updated on the local display and in the operating program (master class 2). Use this function to assign a status to the totalizer. **Options:** ON Totalizer is always updated. OFF Totalizer is only updated if the corresponding totalizer function block for the cyclic data transfer has been configured. **Factory setting:** ON ✎ Note! Especially when executing time-critical applications, optimisation can be carried out if the totalizer function block is unnecessary. For this purpose, OFF must be selected in this function. When doing this, ensure that the totalizer is no longer updated on the local display and in the operating program (master class 2) when selecting OFF.

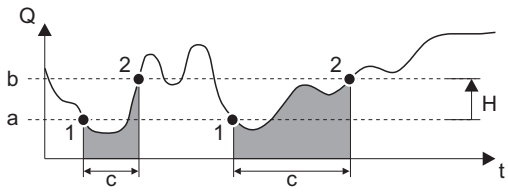
8 Group COMMUNICATION

COMMUNICATION function description	
TAG NAME	Use this function to assign a tag name to the measuring device. You can edit and read this tag name via local operation or by means of the PROFIBUS protocol (Class 2 master). **User input:** Max. 16-character text, permissible characters: A-Z, 0-9, +, –, punctuation marks **Factory setting:** "_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _" (no text)
BUS ADDRESS	Use this function to define the address for the exchange of data via the PROFIBUS PA protocol. **User input:** 0...126 **Factory setting:** 126
WRITE PROTECT	This function shows the position of the jumper used to set general 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 activated and deactivated by means of a jumper on the I/O board (see Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA074D/06/en).
SELECTION GSD	Use this function to select the measuring device's configuration response. ✎ 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. **Options:** MANUFACT.SPEC PROFILE–GSD **Factory setting:** MANUFACT.SPEC

COMMUNICATION function description	
SET UNIT TO BUS	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 execution) ✎ Note! When the function is executed, the input and output scaling 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 preset system units are listed in the Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA074D/06/en in the "Cyclic data exchange" section. ☝ Caution! Activating this function can cause the OUT value to change suddenly; this, in turn, can affect subsequent control routines.
PROFILE VERSION	Use this function to view the profile version. **Display:** 3.0
ACTUAL BAUDRATE	Use this function to view the data transmission rate at which the device communicates, as set in the automation system.
DEVICE ID	Use this function to view the manufacturer-specific device ID. **Display:** 0x152F ✎ Note! If the option PROFILE GSD was selected in the SELECTION GSD function (see Page 24) the PROFILE ID "0x9741" (= 9741 Hex) is displayed in this function.
CHECK CONFIGURATION	Use this function to check whether the configuration for cyclic data exchange of a Class 1 master has been accepted in Proline Prosonic Flow 90 PROFIBUS PA. **Display:** ACCEPTED (configuration accepted) NOT ACCEPTED (configuration not accepted)
BLOCK SELECTION	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 function. If you select the Analog Output (display value), the current measured value is displayed in the DISPLAY VALUE function. **Options:** ANALOG INPUT 1 (volume flow) → displayed in OUT VALUE ANALOG INPUT 2 (sound velocity) → displayed in OUT VALUE ANALOG INPUT 3 (flow velocity) → displayed in OUT VALUE ANALOG OUTPUT 1 (display value) → displayed in DISPLAY VALUE **Factory setting:** ANALOG INPUT 1 (volume flow) ✎ Note! If the option PROFILE GSD was selected in the SELECTION GSD function (see Page 24) the only options that appear in this function are: ANALOG INPUT 1 (volume flow) ANALOG INPUT 2 (sound velocity)

COMMUNICATION function description	
OUT VALUE	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 function. ✎ Note! This function is not available unless one of the following Analog Input function blocks was selected in the BLOCK SELECTION function: ■ ANALOG INPUT 1 ■ ANALOG INPUT 2 ■ ANALOG INPUT 3
DISPLAY VALUE	Use this function to view the display value (output measured value) including the unit. ✎ Note! This function is not available unless ANALOG OUTPUT 1 was selected in the BLOCK SELECTION function.

9 Group PROCESS PARAMETER

PROCESS PARAMETER function description	
ASSIGN LOW FLOW CUT OFF	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	Use this function to specify the on-value for low flow cut off. Low flow cut off is active if the value entered is not equal to "0". The sign of the flow value is then highlighted on the display. ✎ Note! ■ This function is not available unless the VOLUME FLOW option was selected in the ASSIGN LOW FLOW CUT OFF function. ■ The appropriate unit is taken from the SYSTEM UNITS function group (see Page 10). **User input:** 5-digit floating-point number **Factory setting:** 0 l/s
OFF-VALUE LOW FLOW CUT OFF	Use this function to specify the off-value for low flow cut off. Enter the off-value as a positive hysteresis from the on-value. ✎ Note! This function is not available unless the VOLUME FLOW option was selected in the ASSIGN LOW FLOW CUT OFF function. **User input:** 0...100% **Factory setting:** 50% Example:  A0001245 Q = Flow [volume/time] t = Time H = Hysteresis a = On-value = 200 m^3/h (V3H1) b = Off-value = 10% (V3H2) c = Low flow cut off active 1 = Low flow cut off is switched on at 200 m^3/h 2 = Low flow cut off is switched off at 220 m^3/h

PROCESS PARAMETER function description	
ZERO POINT ADJUSTMENT	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 37). **User input:** CANCEL START **Factory setting:** CANCEL Caution! Before carrying this out, please refer to the Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA074D/06/en for a detailed description of the procedure for zero point adjustment. Note! ■ Programming is disabled during zero point adjustment. The message “ZEROPOINT 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 message “ZERO POINT ADJUSTMENT NOT POSSIBLE” is shown on the display. ■ When zero point adjustment is complete, press the E key to display the new zero point. If you press the E key again, the display returns to the ZERO POINT ADJUSTMENT function.

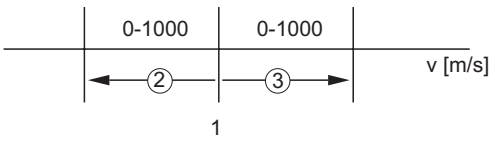
10 Group PIPE DATA

PIPE DATA function description	
PIPE STANDARD	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
NOMINAL DIAMETER	✎ 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	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

PIPE DATA function description	
SOUND VELOCITY PIPE	This function displays the sound velocity in 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 sound velocity must be entered here. **User input:** Fixed-point number 800...6500 m/s **Factory setting:** 3120 m/s
CIRCUMFERENCE	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:** 279.30 mm
PIPE DIAMETER	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:** 88.90 mm
WALL THICKNESS	This function displays the thickness of the pipe walls 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 walls must be entered here. **User input:** Fixed-point number 0.1...100.0 mm **Factory setting:** 3.200 mm

PIPE DATA function description	
LINER MATERIAL	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:** LINER NONE MORTAR RUBBER TAR EPOXY OTHER **Factory setting:** LINER NONE
SOUND VELOCITY LINER	✎ Note! This function does not appear if the option LINER NONE was selected in the LINER MATERIAL function. This function displays the sound velocity of the liner determined via the values entered in the function LINER MATERIAL. 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 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 function
LINER THICKNESS	✎ 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 mm **Factory setting:** 0 mm

11 Group LIQUID DATA

LIQUID DATA function description	
LIQUID	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, LUBE 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 and VISCOSITY functions. **Factory setting:** WATER
TEMPERATURE	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
SOUND VELOCITY LIQUID	This function displays the sound velocity of the liquid determined via the values entered in the functions LIQUID and TEMPERATURE. If you edit the predetermined value the function LIQUID 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 the sound velocity must be entered here. **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 and SOUND VELOCITY POSITIVE 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%).  A0001246 1 = Sound velocity of the liquid 2 = Lower search range: is specified in the SOUND VELOCITY NEGATIVE function. 3 = Upper search range: is specified in the SOUND VELOCITY POSITIVE function. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 1487 m/s

LIQUID DATA function description	
VISCOSITY	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 **Factory setting:** 1 mm^2/s
SOUND VELOCITY NEGATIVE	Use this function to specify the lower search range for the sound velocity of the liquid. **User input:** Fixed-point number 0...1000 m/s **Factory setting:** 500 m/s ✎ Note! Pay particular attention to the information in the SOUND VELOCITY LIQUID function.
SOUND VELOCITY POSITIVE	Use this function to specify the upper search range for the sound velocity of the liquid. **User input:** Fixed-point number 0...1000 m/s **Factory setting:** 300 m/s ✎ Note! Pay particular attention to the information in the SOUND VELOCITY LIQUID function.

12 Group SYSTEM PARAMETER

SYSTEM PARAMETER function description	
INSTALLATION DIRECTION SENSOR	Use this function to reverse the sign of the flow rate variable. **Options:** NORMAL (flow as indicated by the arrow) INVERSE (flow opposite to direction indicated by the arrow) **Factory setting:** NORMAL
MEASURING MODE	✎ Note! This function is merely displayed on the local operation; it is not processed by the measuring system.
POSITIVE ZERO RETURN	Use this function to interrupt the evaluation of measured variables. This is necessary when a piping system is being cleaned, for example. This setting acts on all function and outputs of the measuring device. **Options:** OFF ON → Signal output is set to the ZERO FLOW value **Factory setting:** OFF
FLOW DAMPING	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 ✎ Note! The damping acts on all functions and outputs of the measuring device.

13 Group SENSOR DATA

SENSOR DATA function description	
You can set the parameter settings for the ultrasonic sensors in this group.	
MEASUREMENT	Use this function to define the type of measurement. **Options:** CLAMP ON INSERTION **Factory setting:** CLAMP ON
SENSOR TYPE	Use this function to select the sensor type. **Options:** W-CL-05F-L-B[1)] W-CL-1F-L-B[1)] W-CL-2F-L-B[1)] U-CL-2F-L-A[1)] W-IN-1F-L-B[2)] **Factory setting:** W-CL-2F-L-B [1)] This option is not available unless the CLAMP ON option is set in the MEASUREMENT function. [2)] This option is not available unless the INSERTION option is set in the MEASUREMENT function.
SENSOR CONFIGURATION	Use this function to select the configuration for the ultrasonic sensors. **Options:** NO. TRAVERSE: 1[1)] NO. TRAVERSE: 2[1)] NO. TRAVERSE: 3[1)] NO. TRAVERSE: 4[1)] SINGLE PATH[2)] **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 the CLAMP ON option is set in the MEASUREMENT function. [2)] This option is not available unless the INSERTION option is set in the MEASUREMENT function.
CABLE LENGTH	Use this function to select the length of the sensor cable. **Options:** LENGTH 5 m/15 feet LENGTH 10 m/30 feet LENGTH 15 m/45 feet LENGTH 30 m/90 feet **Factory setting:** LENGTH 5 m/15 feet

SENSOR DATA function description	
POSITION SENSOR	Use this function to view the position of both sensors on the rail. ✎ Note! This function is not available unless the CLAMP ON option is set in the MEASUREMENT function. The number of traverses must be set to 2 or 4 in the SENSOR CONFIGURATION function. **Display:** 4-digit number combination
WIRE LENGTH	Displays the wire length for mounting the sensors at the correct distance apart. ✎ Note! This function is not available unless the CLAMP ON option is set in the MEASUREMENT function. The number of traverses must be set to 1 or 3 in the SENSOR CONFIGURATION function. **Display:** Max. 4-digit floating point number, including unit (e.g. 273.43 mm)
SENSOR DISTANCE	Displays the distance between sensor 1 and sensor 2 as a length measurement. **Display:** Max. 4-digit floating point number, including unit (e.g. 201.84 mm)
PATH LENGTH	Displays the path length. ✎ Note! This function is not available unless the INSERTION option is set in the MEASUREMENT function. **Display:** Max. 4-digit floating point number incl. unit (e.g. 237.32 mm)

14 Group CALIBRATION DATA

CALIBRATION DATA function description	
P-FACTOR	This function shows 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 measeurement will have a reduced linearity.
ZERO POINT	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. +0010.0 ns)
CORRECTION FACTOR	Use this function to enter a correction factor. **User input:** 5-digit floating-point number **Factory setting:** 1.0000 (NO CORRECTION)
DEVIATION SENSOR DISTANCE	Use this function to enter a deviation value for the sensor distance. ✎ Note! This function is not available unless the INSERTION option is set in the MEASUREMENT function. **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm
DEVIATION PATH LENGTH	Use this function to enter a deviation value for the path length. ✎ Note! This function is not available unless the INSERTION option is set in the MEASUREMENT function. **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm

15 Group SUPERVISION

SUPERVISION function description	
ACTUAL SYSTEM CONDITION	Use this function to check the current system condition. **Display:** SYSTEM OK or the fault/notice message with the highest priority. ✎ Note! The meaning and cause of the error as well as the measures for fault elimination are explained in the Operating Instructions Prosonic Flow 90, PROFIBUS PA, BA074D/06/en/.
PREVIOUS SYSTEM CONDITIONS	Use this function to view the most recent fault and notice messages since measuring last started. **Display:** NO ENTRY or the most recent fault/notice messages
ALARM DELAY	Use this function to define a time span in which the criteria for an error have to be satisfied without interruption before a fault or notice message is generated. This notice/fault message delay acts on the display, depending on the setting and type of error. **User input:** 0...100 s (in steps of one second) **Factory setting:** 0 s
SYSTEM RESET	Use this function to restart the measuring system. **Options:** NO RESTART SYSTEM (restart without interrupting power supply) **Factory setting:** NO
TROUBLESHOOTING	Use this function to rectify errors in the EEPROM. The EEPROM is divided into a number of blocks. Select the appropriate block to eliminate the error. ☞ 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“
OPERATION HOURS	The hours of operation of the device appear on the display. **Display:** Depending upon the expired operation hours: Hours of operation < 10 h → display format = 00:00:00 (hr:min:sec) Hours of operation 10...10’000 h → display format = 0000:00 (hr:min) Hours of operation > 10’000 h → display format = 000000 (hr)

16 Group SIMULATION SYSTEM

SIMULATION SYSTEM function description	
SIMULATION FAILSAFE MODE	Use this function to set all inputs, outputs and the totalizer to their defined failsafe modes, in order to check whether they respond correctly. During this time, the words "SIMULATION FAILSAFE MODE" appear on the display. **Options:** OFF ON **Factory setting:** OFF
SIMULATION MEASURAND	Use this function to set all inputs, outputs and the totalizer to their defined flow-response modes, in order to check whether they respond correctly. During this time, the words "SIMULATION MEASURAND" appear on the display. **Options:** OFF VOLUME FLOW SOUND VELOCITY **Factory setting:** OFF Caution! ■ The measuring device cannot be used for measuring while this simulation is in progress. ■ The setting is not saved if the power supply fails.
VALUE SIMULATION MEASURAND	Use this function to specify a selectable value (e.g. 12 m^3/s). This is used to test the assigned parameters in the flowmeter itself and downstream signal loops. Note! This function is not available unless the VOLUME FLOW or SOUND VELOCITY option is set in the SIMULATION MEASURAND function. **User input:** 5-digit floating-point number **Factory setting:** 0 Caution! The setting is not saved if the power supply fails.

17 Group SENSOR VERSION

SENSOR VERSION function description	
SERIAL NUMBER	Displays the serial number of the sensors.

18 Group AMPLIFIER VERSION

AMPLIFIER VERSION function description	
DEVICE SOFTWARE	Displays the current device software version.
SW REVISION NUMBER AMPLIFIER	Displays the software revision number of the amplifier.
I/O MODULE TYPE	Displays the I/O module type.
SW REVISION NUMBER I/O MODULE	Displays the software revision number of the I/O module.

19 Factory settings

19.1 SI units

Parameter	Factory setting
Nominal diameter	80 [mm]
Low flow cut off (v ≈ 0,04 m/s)	12 [dm^3/min]
Full scale value (v ≈ 2,5 m/s)	750 [dm^3/min]
Pulse value	5,0 [dm^3]
Unit totalizer	dm^3
Unit length	mm
Unit temperature	° C

19.2 US units (for USA and Canada only)

Parameter	Factory setting
Nominal diameter	3"
Low flow cut off (v ≈ 0,04 m/s)	2,5 [gal/min]
Full scale value (v ≈ 2,5 m/s)	200 [gal/min]
Pulse value	2,0 [gal]
Unit totalizer	gal
Unit length	mm
Unit temperature	° C

19.3 Language

Country	Language
Australia	English
Austria	Deutsch
Belgium	English
Canada	English
China	Chinese
Czech Republic	Czech
Denmark	English
England	English
Finland	Suomi
France	Francais
Germany	Deutsch
Hong Kong	English
Hungary	English
India	English
Indonesia	Bahasa Indonesia
Instruments International	English
Italy	Italiano
Japan	Japanese
Malaysia	English
Netherlands	Nederlands
Norway	Norsk
Poland	Polish
Portugal	Portuguese
Russia	Russian
Singapore	English
South Africa	English
Spain	Espanol
Sweden	Svenska
Switzerland	Deutsch
Thailand	English
USA	English

20 Index for local operation

Table of contents for PROFIBUS PA

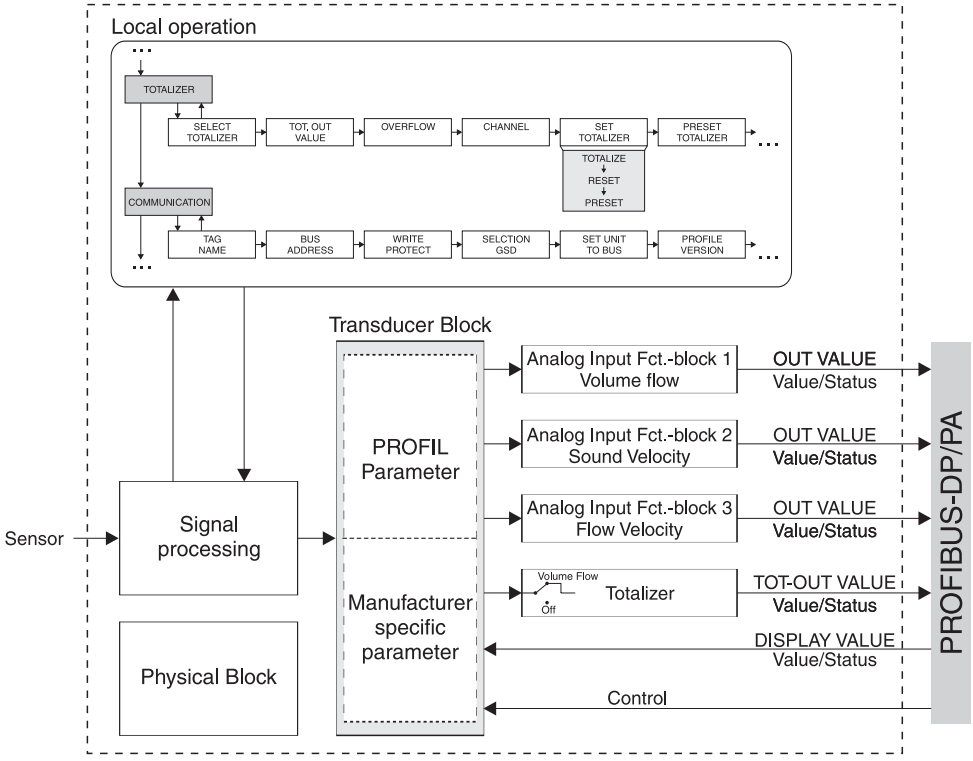
21 Remote operation via PROFIBUS PA

21.1 Block model

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

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

A number of automation-related tasks can be implemented with these blocks. In addition to these blocks, a field device may have any number of other blocks, e.g. several Analog Input function blocks if more than one process variable is available from the field device.



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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 block for technical processing (e.g. scaling, limit value processing). The process variable goes through the entire function block algorithm and is available to the process-control system as an output variable.

22 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.

22.1 Write protection

Hardware write protection for the device parameters is activated and deactivated by means of a jumper on the PROFIBUS-PA I/O board (see Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en).

The HW WRITE PROTECTION parameter (see Page 50) shows the status of the hardware write protection.
The following statuses are possible:
1 → Hardware write protection activated, it is not possible to write to the device
0 → Hardware write protection deactivated, 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 49).
The following entries are permitted:
2457 → Device data can be overwritten (factory setting)
0 → Device data cannot be overwritten

22.2 Physical Block parameters

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				
Matrixtext (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
DEVICE DATA (V0...)				
DEVICE ID (V0H0) *DEVICE_ID (0/27)*	Displays the manufacturer-specific device ID. **Display:** PROSONIC FLOW 90 PBUS	X		M
SERIAL NUMBER (V0H1) *DEVICE_SER_NUM (0/28)*	Displays the serial number of the measuring device.	X		M
SOFTWARE VERSION (V0H2) *SOFTWARE_VERSION (0/24)*	Displays the software version number of the measuring device.	X		M
HARDWARE VERSION (V0H3) *HARDWARE_VERSION (0/25)*	Displays the hardware version number of the measuring device.	X		M

Physical Block				
Matrixtext (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
MANUFACTURER ID (V0H4) *DEVICE_MAN_ID (0/26)*	Displays the manufacturer's ID number. **Display:** 17 (decimal)	X		M
DESCRIPTION (V1...)				
DESCRIPTOR (V1H0) *DEVICE_INSTALL_DATE (0/38)*	For entering the application of the measuring device. **Factory setting:** No description	X	X	O
INSTALLATION DATE (V1H1) *DEVICE_INSTALL_DATE (0/38)*	For entering the installation date. **Factory setting:** No date	X	X	O
MESSAGE (V1H2) *DEVICE_MESSAGE (0/37)*	For entering a message. **Factory setting:** No message	X	X	O
DEVICE CERTIFICATE (V1H3) *DEVICE_CERTIFICATION (0/33)*	Displays the certification of the measuring device. **Factory setting:** No information	X		O
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 activate write protection for the acyclic parameters. **User input:** 0 → Write protection activated, parameters cannot be overwritten. 2457 → Write protection deactivated, parameters can be overwritten. **Factory setting:** 2457 ✎ Note! An “ACCESS DENIED” error message is displayed if an attempt is made to change a parameter when write protection is enabled.	X	X	O

Physical Block				
Matrixtext (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
HW WRITE PROTECT (V3H1) *WRITE_LOCKING (0/34)*	Displays the position of the jumper used to set the general hardware write protection. **Display:** 0 → Write protection deactivated, parameters can be overwritten. 1 → Write protection activated, parameters cannot be overwritten via local operation or by means of the PROFIBUS protocol (Class 2 master). **Factory setting:** 0 ✎ Note! Write protection is activated and deactivated by means of a jumper on the I/O board (see Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en).	X		O
LOCAL OPERATION (V3H2)	Use this parameter to enable local operation. ✎ Note! This parameter is not supported by the Proline Prosonic Flow 90 PROFIBUS PA.			
DEVICE DATA (V4...)				
IDENT NUMBER (V4H0) *IDENT_NUMBER_SELECTOR (0/40)*	For selecting the measuring device's configuration response. ✎ 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. **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 of the PROFILE ID number (0x9760) for multivariable devices ✎ Note! Options 2 and 3 are not supported. **Factory setting:** 1	X	X	O
DIAGNOSIS MASK (V5...)				
MASK (V5H0) *DIAGNOSIS_MASK (Byte 1) (0/31)*	Displays the supported DIAGNOSIS bits of the first diagnosis byte. **Display:** 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M

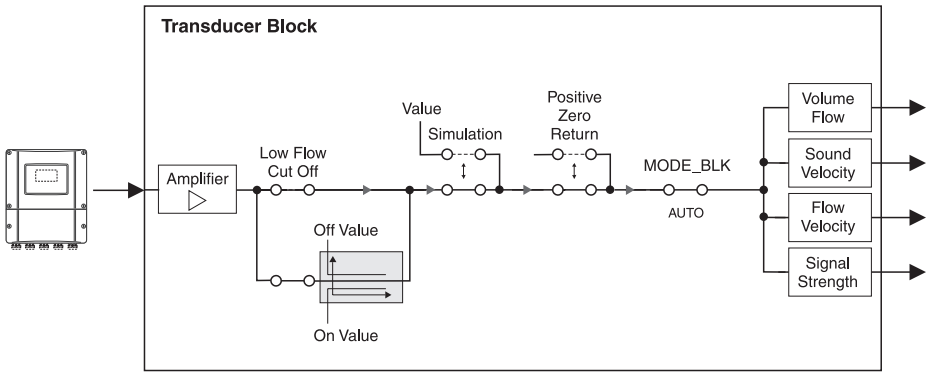
Physical Block				
Matrixtext (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
MASK 1 (V5H1) *DIAGNOSIS_MASK (Byte 2) (0/31)*	Displays the supported DIAGNOSIS bits of the second diagnosis byte. **Display:** 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
MASK 2 (V5H2) *DIAGNOSIS_MASK (Byte 4) (0/31)*	Displays the supported DIAGNOSIS bits of the fourth diagnosis byte. **Display:** 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
DIAG MASK EXTENS. (V5H3) *DIAGNOSIS_MASK_EXTENS (0/32)*	Displays the bit mask which outputs the manufacturer-specific diagnosis messages (see also "System and process error messages" in the Operating Instructions Proline Prosonic Flow 90, PROFIBUS PA, BA074D/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 EXTENS 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 EXTENS 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 EXTENS parameter. **Display:** 0 → Diagnosis message is not supported X → Diagnosis message is supported	X		M
DIAGNOSIS EXTENS (V6H3) *DIAGNOSIS_EXT (0/30)*	Manufacturer-specific information with bit encoding. Several messages are possible.	X		O
BLOCK MODE (V8...)				
TARGET MODE (V8H0) *TARGET_MODE (0/21)*	For selecting the desired operating mode. Only the automatic mode can be selected for the Physical Block. **Options:** AUTO **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLK (Actual) (0/22)*	Displays the current operating mode. **Display:** AUTO	X		M

Physical Block				
Matrixtext (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
NORMAL (V8H2) *MODE_BLK (Normal) (0/22)*	Displays the operating mode for normal operation. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLK (Permitted) (0/22)*	Displays the permissible operating modes. **Display:** AUTO	X		M
ALARM CONFIG (V9...)				
CURRENT (V9H0) *ALARM_SUM (CURRENT) (0/23)*	Displays the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUM (DISABLE) (0/23)*	Displays the acknowledged alarms of the measuring device.	X		M
ST REVISION (V9H5) *ST_REV (0/17)*	If a block has static parameters (Static attribute) which are not changed by the process, then any change to these attributes during optimisation or configuration increments 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 value even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X		M
BLOCK PARAMETER (VA...)				
TAG (VAH0) *TAG_DESC (0/18)*	For entering a user-specific text of max. 32 characters for clear 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 for each 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 instrumentation and control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3)	Displays the profile version implemented in the device. **Display:** 30 (3.0)			

23 Transducer Block (transmission block)

The Transducer Block of the Proline Prosonic Flow 90 PROFIBUS PA contains all the measurement-related and device-specific parameters of the flowmeter. All the settings directly connected with the flow measurement/application are made here. It forms the interface between 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 Block of the Proline Prosonic Flow 90 PROFIBUS PA:



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23.1 Signal processing

The Transducer Block receives several signal variables from the sensor (sound velocity, flow velocity) as the input variables. Other process variables, such as volume flow, signal strength, are derived from these signal variables. The input signals are prepared for measuring via the amplifier.

The VALUE SIMULATION MEASURAND parameter (see Page 81) allows you to specify a simulation value for the Transducer Block in order to test assigned parameters in the device and subsequent function blocks.

A low flow cut off allows you to hide measurement inaccuracies in the low flow range.
You can define a limit value by means of the ON-VALUE LOW FLOW CUT OFF parameter (see Page 58). If the measured flow value drops below 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 67). This is necessary when the piping system is being cleaned, for example.

The process variables of the Transducer Block are output via the following parameters:
volume flow, sound velocity, flow velocity and signal strength.

The most important functions and parameters of the Transducer Block are listed below.
An overview of all the parameters available is provided from Page 54 onwards.

23.2 Block – output variables

The Transducer Block has four process variables:
- Volume flow
- Sound velocity
- Flow velocity
- Signal strength

The assignment dictating which process variable is read into the next Analog Input function block is predefined and cannot be changed:
- The volume flow process variable is assigned to Analog Input function block 1.
- The sound velocity process variable is assigned to Analog Input function block 2.
- The flow velocity process variable is assigned to Analog Input function block 3.
- The signal strength process variable can only be read out via local operation or via a Class 2 master.

23.3 Alarm detection and processing

The Transducer Block does not generate any process alarms. The status of the process variable of the Transducer Block is evaluated in the downstream Analog Input function block. 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 92). More detailed information on the current device status is output in the manufacturer-specific ACTUAL SYSTEM CONDITION parameter (see Page 79).
This parameter also displays the device error that produced an input value that could not be evaluated and thus triggered the process alarm in the Analog Input function block.
More detailed information on troubleshooting is provided in the Operating Instructions Proline Prosonic Flow 90, PROFIBUS PA, BA074D/06/en/.

23.4 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 Page 48).
2. The correct code must be entered in the DEFINE PRIVATE CODE parameter (see Page 58).

23.5 Parameters: Transducer Block “device matrix”

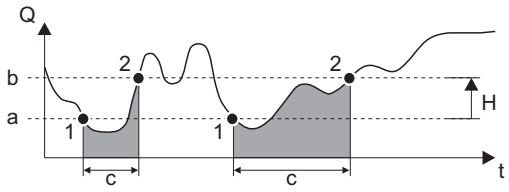
The following table shows all the parameters available for the Transducer Block. The parameters can be changed by means of Class 2 master, such as Commuwin II or PDM (Process Device Management).
A gray ■ background marks the manufacturer-specific parameters. Apart from the parameters in the “Using the profile parameters“ parameter group (Page 83 onwards), no parameter of the Transducer Block can be changed unless the private code has first been entered.
- 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 (V0...)				
VOLUME FLOW (V0H0) *VOLUME_FLOW (1/91)*	Displays the current measured value of the first process variable (volume flow) made available to the Analog Input Block 1 as an input variable. **Display:** 5-digit floating-point number, including unit and sign (e.g. 1.4359 m^3/h; –731.63 gal/d)	X		M
SOUND VELOCITY (V0H1) *SOUND_VELOCITY (1/107)*	Displays the current measured value of the second process variable (sound velocity) made available to the Analog Input Block 2 as an input variable. **Display:** 5-digit fixed-point number, including unit (e.g. 1400.0 m/s, 5249.3 ft/s)	X		M
FLOW VELOCITY (V0H2) *FLOW_VELOCITY (1/123)*	Displays the current measured value of the third process variable (flow velocity) made available to the Analog Input Block 3 as an input variable. **Display:** 5-digit floating-point number, including unit and sign (e.g. 8.0000 m/s, 26.247 ft/s)	X		O
SIGNAL STRENGTH (V0H3) *SIGNAL_STRENGTH (1/124)*	Displays the current signal strength. **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**
SYSTEM UNITS (V1...)				
UNIT VOLUME FLOW (V1H0) *VOLUME_FLOW_UNIT (1/92)*	For selecting the unit for the volume flow. The unit you select here is also valid for: ▪ Switch points (limit value for volume flow, flow direction) ▪ Low flow cut off ✎ Note! The following units of time can be selected: s = second, m = minute, h = hour, d = day **Options:** Metric (... = unit of time, see note): Cubic centimetre → cm^3/... Cubic decimetre → dm^3/... Cubic metre → m^3/... Millilitre → ml/... Litre → l/... Hectolitre → hl/... Megalitre → Ml/... MEGA US (... = unit of time, see note): Cubic centimetre → cc/... Acre foot → af/... Cubic foot → ft^3/... Fluid ounce → oz f/... Gallon → US gal/... Million gallon → US Mgal/... Barrel (nor. fluids: 31.5 gal/bbl) → US bbl/... NORM. Barrel (beer: 31.0 gal/bbl) → US bbl/... BEER Barrel (petrochem.: 42.0 gal/bbl) → US bbl/... PETR. Barrel (filling tanks: 55.0 gal/bbl) → US bbl/... TANK Imperial (... = unit of time, see note): Gallon → imp. gal/... Mega gallon → imp. Mgal/... Barrel (beer: 36.0 gal/bbl) → imp. bbl/... BEER Barrel (petroch.: 34.97 gal/bbl) → imp. bbl/... PETR. **Factory setting:** l/s	X	X	M
UNIT VELOCITY (V1H1) *SOUND_VELOCITY_UNIT (1/108)*	For selecting the unit for the speed. The unit you select here is valid for: ▪ Sound velocity ▪ Flow velocity **Options:** m/s ft/s **Factory setting:** m/s	X	X	M
UNIT VISCOSITY (V1H4) *VISCOSITY_UNIT (1/132)*	For selecting the unit for the viscosity of the fluid. **Options:** mm^2/s cSt St **Factory setting:** mm^2/s	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
UNIT TEMPERATURE (V1H5) *TEMP_UNIT (1/131)*	For selecting the unit for the fluid temperature. ✎ Note! The fluid temperature is entered in the parameter TEMPERATURE (V9H1, see Page 67). **Options:** °C (Celsius) K (Kelvin) °F (Fahrenheit) R (Rankine) **Factory setting:** °C	X	X	O
UNIT LENGTH (V1H6) *NOMINAL_SIZE_UNIT (1/86)*	For selecting the unit for the measure of length. The unit you select here is valid for: ■ Pipe circumference ■ Pipe diameter ■ Wall thickness ■ Wire length ■ Sensor distance ■ Path length ■ Sensor distance deviation ■ Path length deviation **Options:** MILLIMETER INCH **Factory setting:** MILLIMETER	X	X	M
USER INTERFACE (V2...)				
ACCESS CODE (V2H0) *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 = 90, 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 private code.	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
DEFINE PRIVATE CODE (V2H1) *LOCK_PRIVATE_CODE (1/135)*	Use this parameter to define a private code for enabling programming. **User input:** Max. 4-digit number: 0...9999 **Factory setting:** 90 ✎ Note! ■ Programming is always enabled if the code defined = "0". ■ Programming has to be enabled before this code can be changed. When programming is disabled this function cannot be edited. This precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *LOCK_ACCESS_STATUS (1/136)*	Displays the access status of the function matrix. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)	X		O
PROCESS PARAMETER (V3...)				
ASSIGN LOW FLOW CUT OFF (V3H0) *LOW_FLOW_CUTOFF_ASSIGN (1/151)*	Use this parameter to assign the switch point for the low flow cut off. **Options:** OFF VOLUME FLOW **Factory setting:** VOLUME FLOW	X	X	O
ON-VALUE LOW FLOW CUT OFF (V3H1) *LOW_FLOW_CUTOFF (1/79)*	For entering the on-value for low flow cut off. Low flow cut off is active if the value entered is not equal to "0". The sign of the flow value is then highlighted on the display. ✎ Note! ■ This parameter is not available unless the VOLUME FLOW option was selected in the parameter ASSIGN LOW FLOW CUT OFF (V3H0). ■ The appropriate unit is taken from the parameters in the group SYSTEM UNITS (V1, see Page 56). **User input:** 5-digit floating-point number **Factory setting:** 0 l/s	X	X	M

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
OFF-VALUE LOW FLOW CUT OFF (V3H2) *LOW_FLOW_CUTOFF_OFF_VALUE (1/152)*	For entering the off-value for low flow cut off. Enter the off-value as a positive hysteresis from the on-value. ✎ Note! This parameter is not available unless the VOLUME FLOW option was selected in the parameter ASSIGN LOW FLOW CUT OFF (V3H0, see Page 58). **User input:** 0...100% **Factory setting:** 50% Example:  A0001245 Q = Flow [volume/time] t = Time H = Hysteresis a = On-value = 200 m^3/h (V3H1) b = Off-value = 10% (V3H2) c = Low flow cut off active 1 = Low flow cut off is switched on at 200 m^3/h 2 = Low flow cut off is switched off at 220 m^3/h	X	X	O
PIPE DATA (V4...)				
PIPE STANDARD (V4H0) *PIPE_STANDARD (1/155)*	Use this parameter 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 (V4H2) ■ SOUND VELOCITY PIPE (V4H4) ■ LINER MATERIAL (V4H8) If you edit these parameters the pipe standard will be reset to the option OTHERS. **Factory setting:** DIN PN10	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
NOMINAL DIAMETER (V4H1) *NOMINAL_DIAMETER (1/156)*	✎ Note! This parameter is not available if the option OTHER was selected in the parameter PIPE STANDARD (V4H0). Use this parameter 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
PIPE MATERIAL (V4H2) *PIPE_MATERIAL (1/157)*	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
SOUND VELOCITY PIPE (V4H4) *SOUND_VELOCITY_PIPE (1/159)*	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. **User input:** Fixed-point number 800...6500 m/s **Factory setting:** 3120 m/s	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
PIPE CIRCUMFERENCE (V4H5) *CIRCUMFERENCE (1/160)*	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:** 279.30 mm	X	X	O
PIPE DIAMETER (V4H6) *PIPE_DIAMETER (1/161)*	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:** 88.90 mm	X	X	O
WALL THICKNESS (V4H7) *WALL_THICKNESS (1/162)*	This parameter displays the thickness of the pipe walls 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 thickness of the pipe walls must be entered here. **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) *LINER_MATERIAL (1/163)*	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 the parameter NOMINAL DIAMETER (V4H1) 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:** LINER NONE MORTAR RUBBER TAR EPOXY OTHER **Factory setting:** NO LINER	X	X	O
PIPE ADJUSTMENT (V5...)				
ZERO POINT ADJUSTMENT (V5H0) *ZERO_POINT_ADJUST (1/83)*	Use this parameter to start zero point adjustment automatically. The new zero point determined by the measuring system is adopted by the parameter ZERO POINT (V4H1). **User input:** CANCEL RUN **Factory setting:** CANCEL Caution! Before carrying this out, please refer to the Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en for a detailed description of the procedure for zero point adjustment. Note! ■ Programming is disabled during zero point adjustment. The message “ZEROPOINT 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 message “ZERO ADJUST NOT POSSIBLE” is shown on the display.	X	X	M

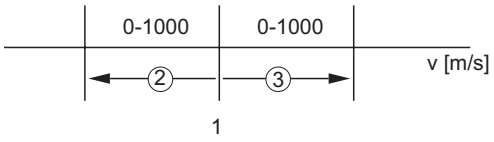
Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
SOUND VELOCITY LINER (V5H1) *SOUND_VELOCITY_LINER (1/164)*	✎ Note! This parameter is not available if the option LINER NONE was selected in the parameter LINER MATERIAL (V4H8). This parameter displays the sound velocity of the liner determined via the values entered in theparameter 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 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 (V4H8) parameter.	X	X	O
LINER THICKNESS (V5H2) *LINER_THICKNESS (1/165)*	✎ Note! This parameter is not available if the option LINER NONE was selected in the parameter LINER MATERIAL (V4H8). Use this parameter to enter the thickness of the liner. **User input:** Fixed-point number 0.1...100 mm **Factory setting:** 0 mm	X	X	O
PROFIBUS-PA (V6...)				
WRITE PROTECTION (V6H0) *HW_WRITE_PROTECTION (0/41)*	This parameter shows the position of the jumper used to set general write protection. **Display:** OFF → Write protection deactivated ON → Write protection activated; parameters cannot be changed via 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 board (see Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en).	X		O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
SELECTION GSD (V6H1) *IDENT_NUMBER_SELECTOR (0/40)*	Use this parameter to select the measuring device's configuration response. ✎ 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. **Options:** MANUFACT.SPEC PROFILE–GSD **Factory setting:** MANUFACT.SPEC			
SET UNIT TO BUS (V6H2) *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 preset system units are listed in the Operating Instructions Proline Prosonic Flow 90, PROFIBUS PA, BA074D/06/en/. **Options:** CANCEL YES (SET UNITS) **Factory setting:** CANCEL ☞ Caution! Activating this parameter can cause the OUT output value to change suddenly; this, in turn, can affect subsequent control routines.	X	X	O
BLOCK SELECTION (V6H3) *PROFIBUS_BLOCK_SELECTION (1/143)*	Use this parameter to select an Analog Input function block whose OUT VALUE (output value) will be displayed, complete with unit and status. **Options:** ANALOG INPUT 1 ANALOG INPUT 2 ANALOG INPUT 3 **Factory setting:** ANALOG INPUT 1	X	X	O
OUT VALUE (V6H4) *PROFIBUS_OUT_VALUE (1/144)*	Use this parameter to display the OUT VALUE (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) *PROFIBUS_OUT_VALUE (1/144)*	Use this parameter to display the OUT VALUE (output) status in hexadecimal notation. The individual status values are explained in the Operating Instructions Proline Prosonic Flow 90, PROFIBUS PA, BA074D/06/en/. ✎ Note! This parameter cannot be viewed on the local operation.	X		M

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
DISPLAY VALUE (V6H6) *LOCAL_DISPLAY_INPUT (0/57)*	Use this parameter to transmit a value and status calculated by an automation system directly to the Proline Prosonic Flow 90 PROFIBUS PA. 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) *LOCAL_DISPLAY_INPUT (0/57)*	Use this parameter to display the DISPLAY VALUE STATUS in hexadecimal notation. The individual status values are explained in the Operating Instructions Proline Prosonic Flow 90, PROFIBUS PA, BA074D/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 operation.	X		O
CYCL. CALC. TOT (V6H8) *CYCL_CALC_TOT*	Use this function to define whether the totalizer is updated on the local display and in the operating program (master class 2). Use this function to assign a status to the totalizer. **Options:** ONTotalizer is always updated. OFFTotalizer is only updated if the corresponding totalizer function block for the cyclic data transfer has been configured. **Factory setting:** ON ✎ Note! Especially when executing time-critical applications, optimisation can be carried out if the totalizer function block is unnecessary. For this purpose, OFF must be selected in this function. When doing this, ensure that the totalizer is no longer updated on the local display and in the operating program (master class 2) when selecting OFF.	X		O
PROFIBUS INFO (V7...)				
BUS ADDRESS (V7H0) *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.			
ACTUAL BAUDRATE (V7H2) *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) *PROFIBUS_DEVICE_ID (1/147)*	Use this parameter to view the manufacturer-specific device ID. **Display:** 152F Hex ✎ Note! If the option PROFILE GSD was selected in the parameter SELECTION GSD (V6H1, see Page 64), the DEVICE ID 9741 Hex is displayed in this parameter.	X		O
CHECK CONFIGURATION (V7H4) *PROFIBUS_CHECK_CONFIG (1/146)*	Use this function to check whether the configuration for cyclic data of a Class 1 master exchange has been accepted in Proline Prosonic Flow 90 PROFIBUS PA. **Display:** ACCEPTED (configuration accepted) NOT ACCEPTED (configuration not accepted)	X		O
SYSTEM PARAMETERS (V8...)				
MEASURING MODE (V8H0) *MEASUREMENT_MODE (1/80)*	Use this parameter 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) *SENSOR_MEASUREMENT (1/81)*	Use this parameter to reverse the sign of the flow rate variable. **Options:** FORWARD REVERSE **Factory setting:** FORWARD	X	X	O
FLOW DAMPING (V8H2) *SYSTEM_FLOW_DAMPING (1/174)*	Use this parameter to set the filter depth of the digital filter. The sensitivity of the flow measurement signal can be reduced with respect to 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 ✎ Note! The damping acts on all parameters and outputs of the measuring device.	X	X	O

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
POSITIVE ZERO RETURN (V8H3) *SYSTEM_POSITIVE_ZERO_RETURN (1/175)*	Use this parameter to interrupt evaluation of measured variables. This is necessary when a piping system is being cleaned, for example. The selection acts on all parameters 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) *LIQUID (1/167)*	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, LUBE 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) *LIQUID_TEMPERATURE (1/168)*	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 (V9H2) *LIQUID_SOUND_VELOCITY (1/169)*	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. **Transmitter search range:** The measuring device searches for the measuring signal within a defined sound velocity range. You specify the search range in the parameters SOUND VELOCITY NEGATIVE (V9H4) and SOUND VELOCITY POSITIVE (V9H5). 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%).  A0001246 1 = Sound velocity of the liquid 2 = Lower search range: is specified in the SOUND VELOCITY NEGATIVE (V9H4) function. 3 = Upper search range: is specified in the SOUND VELOCITY POSITIVE (V9H5) function. **User input:** Fixed-point number 400...3000 m/s **Factory setting:** 1487 m/s	X	X	O
VISCOSITY (V9H3) *LIQUID_VISCOSITY (1/170)*	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

Transducer Block (device matrix)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
SOUND VELOCITY NEGATIVE (V9H4) *S_VEL_NEG* *(1/171)*	Use this function to specify the lower search range for the sound velocity of the liquid. **User input:** Fixed-point number 0..1000 m/s **Factory setting:** 500 m/s ✎ Note! Pay particular attention to the information in the paramater SOUND VELOCITY (V9H2).	X	X	O
SOUND VELOCITY POSITIVE (V9H5) *S_VEL_POS* *(1/172)*	Use this function to specify the upper search range for the sound velocity of the liquid. **User input:** Fixed-point number 0...1000 m/s **Factory setting:** 300 m/s ✎ Note! Pay particular attention to the information in the paramater SOUND VELOCITY (V9H2).	X	X	O
MEASURING POINT (VA...)				
TAG NAME (VAH0) *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. 16-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.			
DEVICE NAME (VAH6)	Use this parameter to view the device name. **Factory setting:** PROSONIC 90			

23.6 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) *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 = 90, 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 private code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *LOCK_PRIVATE_CODE (1/135)*	Use this parameter to define a private code for enabling programming. **User input:** Max. 4-digit number: 0...9999 **Factory setting:** 90 ✎ Note! ■ Programming is always enabled if the code defined = “0“. ■ Programming has to be enabled before this code can be changed. When programming is disabled this function cannot be edited. This precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *LOCK_ACCESS_STATUS (1/136)*	Displays the access status of the function matrix. **Display:** ACCESS CUSTOMER (parameterisation enabled) LOCKED (parameterisation disabled)	X		O
SENSOR PARAMETERS (V3...)				
MEASUREMENT (V3H0) *SENSOR_MEASUREMENT (1/177)*	Use this function to define the type of measurement. **Options:** CLAMP ON INSERTION **Factory setting:** CLAMP ON	X	X	O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
SENSOR TYPE (V3H1) *SENSOR_TYPE (1/178)*	Use this function to select the sensor type. **Options:** W-CL-05F-L-B[1)] W-CL-1F-L-B[1)] W-CL-2F-L-B[1)] U-CL-2F-L-A[1)] W-IN-1F-L-B[2)] **Factory setting:** W-CL-2F-L-B [1)] This option is not available unless the CLAMP ON option is set in the MEASUREMENT (V3H0, see Page 70) parameter. [2)] This option is not available unless the INSERTION option is set in the MEASUREMENT (V3H0, see Page 70) parameter.	X	X	O
SENSOR CONFIGURATION (V3H2) *SENSOR_CONFIG (1/179)*	Use this parameter to select the configuration for the ultrasonic sensors. **Options:** NO. TRAVERSE: 1[1)] NO. TRAVERSE: 2[1)] NO. TRAVERSE: 3[1)] NO. TRAVERSE: 4[1)] SINGLE PATH[2)] **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 the CLAMP ON option is set in the MEASUREMENT (V3H0, see Page 70) parameter . [2)] This option is not available unless the INSERTION option is set in the MEASUREMENT (V3H0, see Page 70) parameter.	X	X	O
CABLE LENGTH (V3H3) *SENSOR_CABLE_LENGTH (1/180)*	Use this parameter to select the length of the sensor cable. **Options:** LENGTH 5 m/15 feet LENGTH 10 m/30 feet LENGTH 15 m/45 feet LENGTH 30 m/90 feet **Factory setting:** LENGTH 5 m/15 feet	X	X	O
SENSOR POSITION (V3H4) *SENSOR_POSITION (1/181)*	Use this parameter to view the position of both sensors on the rail. ✎ Note! This parameter is not available unless the CLAMP ON option is set in the MEASUREMENT (V3H0, see Page 70) parameter. The number of traverses must be set to 2 or 4 in the SENSOR CONFIGURATION (V3H2, see Page 71) parameter . **Display:** 4-digit number combination	X		O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
WIRE LENGTH (V3H5) *SENSOR_WIRE_LENGTH (1/182)*	Displays the wire length for mounting the sensors at the correct distance apart. ✎ Note! This parameter is not available unless the CLAMP ON option is set in the MEASUREMENT (V3H0, see Page 70) parameter. The number of traverses must be set to 1 or 3 in the SENSOR CONFIGURATION (V3H2, see Page 71) parameter. **Display:** Max. 4-digit number, including unit (e.g. 273.43 mm)	X	X	O
SENSOR DISTANCE (V3H6) *SENSOR_DISTANCE (1/183)*	Displays the distance between sensor 1 and sensor 2 as a length measurement. **Display:** Max. 4-digit number, including unit (e.g. 201.84 mm)	X	X	O
PATH LENGTH (V3H8) *SENSOR_PATH_LENGTH (1/185)*	Displays the path length. ✎ Note! This parameter is not available unless the INSERTION option is set in the MEASUREMENT (V3H0, see Page 70) parameter. **Display:** Max. 4-digit number, including unit (e.g. 237.32 mm)	X	X	O
CALIBRATION DATA (V4...)				
P-FACTOR (V4H0) *SENSOR_P_FACTOR (1/186)*	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 measeurement will have a reduced linearity.	X	X	O
ZERO POINT (V4H1) *SENSOR_ZERO_POINT (1/187)*	Use this parameter 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)	X	X	O
CORRECTION FACTOR (V4H3) *SENSOR_CORRECTION_FACTOR (1/188)*	Use this parameter to enter a correction factor. **User input:** 5-digit floating-point number **Factory setting:** 1.0000 (NO CORRECTION)	X	X	O

Transducer Block (sensor data)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
DEVIATION SENSOR DISTANCE (V4H4) *SENSOR_DEV_SENSOR (1/189)*	Use this parameter to enter a deviation value for the sensor distance. ✎ Note! This parameter is not available unless the INSERTION option is set in parameter MEASUREMENT (V3H0, see Page 70). **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) *SENSOR_DEV_PATH_LENGTH (1/191)*	Use this parameter to enter a deviation value for the path length. ✎ Note! This parameter is not available unless the INSERTION option is set in the parameter MEASUREMENT (V3H0, see Page 70). **User input:** 5-digit floating-point number, including unit and sign (e.g. +2.0000 mm) **Factory setting:** 0 mm	X	X	O
MEASURING POINT (VA...)				
TAG NAME (VAH0) *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. 16-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.			
DEVICE NAME (VAH6)	Use this parameter to view the device name. **Factory setting:** PROSONIC 90			

23.7 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) *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 programming by entering your private code (factory setting = 90, 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 private code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *LOCK_PRIVATE_CODE (1/135)*	Use this parameter to define a private code for enabling programming. **User input:** Max. 4-digit number: 0...9999 **Factory setting:** 90 ✎ Note! ■ Programming is always enabled if the code defined = “0“. ■ Programming has to be enabled before this code can be changed. When programming is disabled this function cannot be edited. This precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *LOCK_ACCESS_STATUS (1/136)*	Displays the access status of the function matrix. **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) *HMI_LANGUAGE (0/78)*	Use this function to select the language for all texts, parameters and messages shown on the local display. ✎ Note! The displayed options depend on the available language group shown in the LANGUAGE GROUP function. **Options:** Language group WEST EU / USA: ENGLISH, DEUTSCH, FRANCAIS, ESPANOL, ITALIANO, NEDERLANDS, PORTUGUESE Language group EAST EU / SCAND.: ENGLISH, NORSK, SVENSKA, SUOMI, POLISH, CZECH, RUSSIAN Language group ASIA: ENGLISH, BAHASA INDONESIA, JAPANESE (syllabary) Language group CHINESE: CHINESE, ENGLISH **Factory setting:** Country-dependent ✎ Note! ■ If you press the ⊞ keys simultaneously during startup, the language defaults to “ENGLISH”. ■ You can change the language group via the configuration software Fieldtool. Please do not hesitate to contact your Endress+Hauser sales office if you have any questions.	X	X	O
DISPLAY DAMPING (V3H1) *HMI_DAMPING (0/79)*	Use this parameter to enter a time constant defining how the display reacts to severely fluctuating flow variables, either very quickly (enter a low time constant) or with damping (enter a high time constant). **User input:** 0...100 s **Factory setting:** 1 s ✎ Note! The damping is switched off if the setting is “0 s“.	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
CONTRAST LCD (V3H2) *HMI_LCD_CONTRAST (0/80)*	Use this parameter to optimise the contrast of the local display to suit local operating conditions. **User input:** 10...100% **Factory setting:** 50%	X	X	O
BACKLIGHT (V3H3) *HMI_LCD_BACKLIGHT (0/81)*	Use this function to optimize the backlight to suit local operating conditions. **User input:** 10...100% **Factory setting:** 50%	X	X	O
MAIN LINE (V4...)				
ASSIGN (V4H0) *HMI_MAIN_L_ASSIGN (0/104)*	Use this parameter to define which display value is assigned to the main line (top line of the local display). This value is displayed during normal operation. **Options:** OFF VOLUME FLOW VOLUME FLOW IN % SOUND VELOCITY FLOW VELOCITY AI1 - OUT VALUE AI2 - OUT VALUE AI3 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1 **Factory setting:** VOLUME FLOW ✎ Note! If the option PROFILE-GSD was selected in the parameter SELECTION GSD (V6H1, see Page 64), the options AI3 - OUT VALUE and A0 - DISP. VALUE are **not** available in this function.	X	X	O
100% VALUE (V4H1) *HMI_MAIN_L_100_VALUE (0/105)*	Use this parameter to define the flow value which should be shown on the display as the 100% value. ✎ Note! This parameter is not available unless the VOLUME FLOW IN % option was selected in the parameter ASSIGN (V4H0, siehe S. 76). **User input:** 5-digit floating-point number, including unit and sign **Factory setting:** 10.000 l/s	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
FORMAT (V4H2) *HMI_MAIN_L_FORMAT (0/106)*	Use this parameter to define the maximum number of places after the decimal point displayed for the reading in the main line. **Options:** XXXXX. - XXXX.X - XXX.XX - XX.XXX -X.XXXX **Factory setting:** X.XXXX ✎ Note! ■ Note that this setting only affects the reading as it appears on the display, it has no influence on the accuracy of the system's calculations. ■ The places after the decimal point as computed by the measuring device cannot always be displayed, depending on this setting and the engineering unit. In these instances an arrow appears on the display between the measured value and the engineering unit (e.g. 1.2 → m^3/h), indicating that the measuring system is computing with more decimal places than can be shown on the display.	X	X	O
ADDITIONAL LINE (V6...)				
ASSIGN (V6H0) *HMI_ASSIGN_LINE_2 (0/107)*	Use this parameter to define which display value is assigned to the additional line (bottom line of the local display). This value is displayed during normal operation. **Options:** OFF VOLUME FLOW VOLUME FLOW IN % SOUND VELOCITY FLOW VELOCITY OPERATING/SYSTEM CONDITION DISPLAY FLOW DIRECTION VOLUME FLOW BARGRAPH IN % SIGNAL STRENGTH BARGRAPH AI1 - OUT VALUE AI2 - OUT VALUE AI3 - OUT VALUE A0 - DISP. VALUE TOT. OUT VALUE 1 TAG NAME **Factory setting:** VOLUME FLOW IN % ✎ Note! If the option PROFILE-GSD was selected in the parameter SELECTION GSD (V6H1, see Page 64), the options AI3 - OUT VALUE and A0 - DISP. VALUE are **not** available in this function.	X	X	O

Transducer Block (display functions)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
MEASURING POINT (VA...)				
TAG NAME (VAH0) *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. 16-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.			
DEVICE NAME (VAH6)	Use this parameter to view the device name. **Factory setting:** PROSONIC 90			

23.8 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) *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 meaning and cause of the error as well as the measures for fault elimination are explained in the Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en.	X		O
PREVIOUS SYSTEM CONDITIONS (V0H1) *PREV_SYS_COND (0/84)*	For viewing the most recent fault and notice messages since measuring last started. **Display:** Most recent fault or notice messages.	X		O
SYSTEM RESET (V0H2) *SYSTEM_RESET (1/206)*	Use this parameter to restart the measuring system. **Options:** NO RESET RESTART SYSTEM (restart without interrupting power supply) **Factory setting:** NO RESET	X	X	O
ALARM DELAY (V0H3) *DIAG_ALARM_DELAY (1/205)*	Use this parameter to define a time span in which the criteria for an error have to be satisfied without interruption before a fault or notice message is generated. This notice/fault message delay acts on the display, depending on the setting and type of error. **User input:** 0...100 s (in steps of one second) **Factory setting:** 0 s	X	X	O
TROUBLESHOOTING (V0H4) *TROUBLESHOOTING (0/88)*	Use this parameter to rectify errors in the EEPROM. The EEPROM is divided into a number of blocks. Select the appropriate block to eliminate the error. ☝ 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) *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 = 90, 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 private code.	X	X	O
DEFINE PRIVATE CODE (V2H1) *LOCK_PRIVATE_CODE (1/135)*	Use this parameter to define a private code for enabling programming. **User input:** Max. 4-digit number: 0...9999 **Factory setting:** 90 ✎ Note! ■ Programming is always enabled if the code defined = “0“. ■ Programming has to be enabled before this code can be changed. When programming is disabled this function cannot be edited. This precaution prevents others from accessing your private code.	X	X	O
STATUS ACCESS (V2H2) *LOCK_ACCESS_STATUS (1/136)*	Displays the access status of the function matrix. **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 (V4...)				
SIMULATION MEASURAND (V4H0) *SIM_MEASURAND (1/208)*	Use this parameter to simulate the output of the Transducer Block as a way of testing the response of the downstream function blocks. During this time, the message "SIMULATION MEASURAND" appears on the local operation. In the operating tool (e.g. Commuwin II) the message "SIMULATION MEASUREMENT" is output in the ACTUAL SYSTEM CONDITION parameter (→ partial matrix "Version info" → V0H0). Simulation affects all AI (Analog Input) Blocks and the TOT (totalizer) Block. **Options:** OFF VOLUME FLOW SOUND VELOCITY **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 (see Page 64) parameter, 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 (totalizer) Block via the TOTAL. UNIT (see Page 106) parameter. In the AI (Analog Input) Blocks you can use the OUT UNIT parameter (see Page 94) 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) *SIM_VALUE (1/209)*	Use this parameter to define a selectable value (e.g. 12 m^3/s). This is used to test the assigned parameters in the flowmeter itself and downstream signal loops. ✎ Note! This parameter is not displayed unless the SIMULATION MEASURAND parameter is active. **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**
SIM. FAILSAFE MODE (V4H2) *SIM_FSAFE_MODE (1/210)*	Use this parameter to simulate the error response of the Transducer Block and the function blocks. **Options:** OFF ON **Factory setting:** OFF ✎ Note! The error response of the function blocks must be defined in the appropriate AI (Analog Input) Block or TOT (totalizer) Block (see the description of the function block in question).	X	X	O
SENSOR (V6...)				
SERIAL NUMBER (V6H0) *SERIAL_NUM (0/60)*	Displays the serial number of the sensors.	X	X	O
INFO AMPLIFIER (V7...)				
SW-REV. AMPLIFIER (V7H2) *SW_REV_AMP (0/68)*	Displays the software revision number of the amplifier.	X	X	O
I/O MODULE INFO (V8...)				
I/O TYPE (V8H0) *IO_TYPE (0/71)*	Displays the I/O module type.	X		O
SW-REV. I/O (V8H3) *SW_REV_IO (0/74)*	Displays the software revision number of the I/O module.	X	X	O
MEASURING POINT (VA...)				
TAG NAME (VAH0) *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. 16-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.			
DEVICE NAME (VAH6)	Use this parameter to view the device name. **Factory setting:** PROSONIC 90			

23.9 Parameters: Transducer Block "profile parameter"

Transducer Block (Using the profile parameters)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
VOLUME FLOW (V0...)				
VOLUME FLOW (V0H0) *VOLUME_FLOW (1/91)*	Use this parameter to display the current measured value of the first process variable (volume flow) made available to the Analog Input Block 1 as an input variable. **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)	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.			
UNIT (V0H2) *VOLUME_FLOW_UNIT (1/92)*	Use this parameter to select the displayed unit for the volume flow. **Options:** m^3/h l/s ft^3/min gal/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) *VOLUME_FLOW_LO_LIMIT (1/93)*	Use this parameter to enter the measuring device's lower range value for volume flow.	X	X	M
UPPER RANGE VAL.(V0H4) *VOLUME_FLOW_HI_ LIMIT (1/94)*	Use this parameter to enter the measuring device's upper range value for volume flow.	X	X	M
ULTRASONIC (V4...)				
SOUND VELOCITY (V4H0) *SOUND_VELOCITY (1/107)*	Use this parameter to display the current measured value of the second process variable (sound velocity) made available to the Analog Input Block 2 as an input variable. **Display:** 5-digit fixed-point number, including unit (e.g. 1400.0 m/s, 5249.3 ft/s)	X		M
STATUS (V4H1)	Use this parameter to display the current status of the second process variable (sound velocity) made available to the Analog Input Block 2 as an input variable.			
UNIT (V4H2) *SOUND_VELOCITY_UNIT (1/108)*	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

Transducer Block (Using the profile parameters)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
LOWER RANGE VAL. (V4H3) *SOUND_VELOCITY_LO_LIMIT (1/109)*	Use this parameter to enter the measuring device's lower range value for sound velocity.	X	X	M
UPPER RANGE VAL. (V4H4) *SOUND_VELOCITY_HI_LIMIT (1/110)*	Use this parameter to enter the measuring device's upper range value for sound velocity.	X	X	M
SYSTEM PARAMETER (V7...)				
MEASURING MODE(V7H0) *MEASUREMENT_MODE (1/80)*	Use this parameter to set the flow mode as bidirectional or unidirectional. **Options:** UNIDIRECTIONAL BIDIRECTIONAL **Factory setting:** BIDIRECTIONAL	X	X	M
FLOW DIRECTION (V7H1) *FLOW_DIRECTION (1/81)*	Use this parameter to set the sign of the flow rate variable. **Options:** NORMAL INVERSE **Factory setting:** NORMAL	X	X	M
LOW FLOW CUT OFF (V7H2) *LOW_FLOW_CUTOFF (1/79)*	Use this parameter to assign the switch point (as a technical unit) for low flow cut off. **User input:** 5-digit floating-point number **Factory setting:** 0 m^3/h	X	X	M
ZERO POINT (V7H3) *ZERO_POINT (1/82)*	Displays the current zero-point correction value for the sensors. Zero-point correction is calculated and set at the factory. **User input:** Max. 4-digit number: –1000...+1000 **Factory setting:** Depends on calibration	X	X	M
ZERO POINT ADJUSTMENT (V7H4) *ZERO_POINT_ADJUST (1/83)*	Use this parameter to start zero point adjustment automatically. The new zero point determined by the measuring system is adopted by the ZERO POINT function. **Options:** CANCEL EXECUTE **Factory setting:** CANCEL	X	X	M
ZERO POINT UNIT (V7H5) *ZERO_POINT_UNIT (1/84)*	Use this parameter to enter the unit for the zero point. **Options:** mm/s **Factory setting:** mm/s	X	X	M

Transducer Block (Using the profile parameters)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
CALIBRATION FACTOR (V7H6) *CALIBR_FACTOR (1/78)*	Use this parameter to enter the calibration factor. **User input:** 5-digit fixed-point number: 0.5000...2.0000 **Factory setting:** depends on nominal diameter and calibration ☝ Caution! Do not change this value, because a change will affect the accuracy of the measuring device.	X	X	M
NOMINAL SIZE (V7H7) *NOMINAL_SIZE (1/85)*	Use this parameter to enter the nominal diameter of the measuring device. **User input:** 2...2000 mm or 1/12...78" **Factory setting:** Depends on the size of the sensor	X	X	M
NOMINAL SIZE UNIT (V7H8) *NOMINAL_SIZE_UNIT (1/86)*	Use this parameter to select the unit of the nominal diameter. **Options:** MM INCH **Factory setting:** MM	X	X	M
BLOCK MODE (V8...)	**General information on the MODE_BLK parameter group:** There are three elements in this parameter group: ■ The current operating mode of the block (Actual_Mode) ■ The modes supported by the block (Permitted_Mode) ■ The normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the "out-of-service" mode (O/S). A function block generally offers a choice of operating modes, whereas the other block types support only the AUTO mode, for example.			
TARGET MODE (V8H0) *TARGET_MODE (1/75)*	For selecting the desired operating mode. Only the automatic mode can be selected for the Transducer Block. **Options:** AUTO **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLK (Actual) (1/76)*	Displays the current operating mode. **Display:** AUTO	X		M
NORMAL (V8H2) *MODE_BLK (Normal) (1/76)*	Displays the operating mode for normal operation. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLK (Permitted) (1/76)*	Displays the permissible operating modes. **Display:** AUTO	X		M

Transducer Block (Using the profile parameters)				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
UNIT MODE (V8H7)	Use this parameter to select the form in which you want the units displayed. In the **list** mode the units are displayed with the conventional abbreviations, for example: l/s. In the **number** mode the units are displayed in the numerical code defined in the 3.0 profiles, for example: 1351 (l/s).			
ALARM CONFIG (V9...)	**General information on the ALARM_CONFIG parameter group:** 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_SUM (CURRENT) (1/77)*	Use this parameter to view the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUM (DISABLE) (1/77)*	Use this parameter to view the acknowledged alarms of the measuring device.	X		M
ST REVISION (V9H5) *ST_REV (1/71)*	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 value even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X		M
BLOCK PARAMETER (VA...)				
TAG (VAH0) *TAG_DESC (1/72)*	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) *STRATEGY (1/73)*	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
ALERT KEY (VAH2) *ALERT_KEY (1/74)*	For entering the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3)	Displays the profile version implemented in the device. **Display:** 30			

24 Function blocks, general

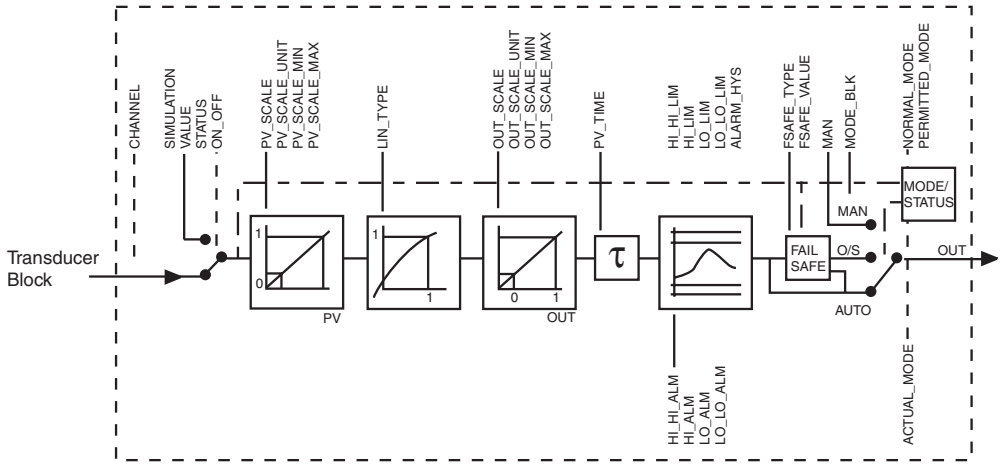
The function blocks contain the basic automation functions of the measuring device. We distinguish between different function blocks, e.g. Analog Input function block, Analog Output function block, Totalizer Block, etc.
Each of these function blocks is used to execute different application functions. This means that device errors such as amplifier errors can be reported to the automation system automatically.
The function blocks process the input values in accordance with their specific algorithm and their parameters which are internally available. They generate output values that are then made available to the automation system for further processing.

25 Analog Input function block

In the Analog Input function block, the process variables (volume flow, sound velocity and flow velocity) from the Transducer Block are prepared for the subsequent automation functions (e.g. scaling and limit value processing). Three Analog Input function blocks are available to the Proline Prosonic Flow 90 PROFIBUS PA.

25.1 Signal processing

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



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The Analog Input function block receives its input value from the Transducer Block.
The input values are permanently assigned to the Analog Input function block.
- Volume flow → Analog Input function block 1 (AI 1)
- Sound velocity → Analog Input function block 2 (AI 2)
- Flow velocity → Analog Input function block 3 (AI 3)

The SIMULATION parameter group (see Page 81) 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 RISING TIME parameter (see Page 95) a filter time can be specified for damping the converted primary value (PV). If a time of 0 seconds is specified, the input value is not damped.
The BLOCK MODE parameter group (see Page 85) is used to select the operating mode of the Analog Input function block. If the MAN (manual) operating mode is selected, the OUT VALUE and the OUT STATUS (see Page 92) can be specified directly.

OUT VALUE 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 then a limit value process alarm (e.g. HI ALARM, LO LO ALARM, 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 92 onwards.

25.2 Selecting the operating mode

The operating mode is set by means of the BLOCK MODE parameter group (see Page 85).
The Analog Input function block supports the following operating modes:
- AUTO (automatic mode)
- MAN (manual mode)
- O/S (out of service)

25.3 Selecting the units

The system unit for volume flow can be changed by means of the local operation or using 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, see Page 64) by means of the local operation or using Commuwin II.
Another way of changing the unit is to use the PV SCALE and OUT SCALE parameters (see Page 90 “Scaling the input value”).

25.4 Status of the output value, OUT STATUS

The status of the Analog Input function block and the validity of the OUT VALUE are relayed to the downstream function blocks by means of the status of the OUT parameter group. The following status values can be displayed:

- GOOD_NON_CASCADE
  The OUT VALUE is valid and can be used for further processing.

- UNCERTAIN
  The OUT VALUE can only be used for further processing to a limited extent.

- BAD
  The OUT VALUE 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 Proline Prosonic Flow 90, PROFIBUS PA, BA074D/06/en/).

25.5 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 98) 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 BLOCK MODE parameter group (see Page 99) to MAN and specify the desired output value directly in the OUT VALUE parameter (see Page 92).

25.6 Error response, FAILSAFE ACTION

If an input or simulation value has the status BAD, the Analog Input function block uses the response defined in the FAILSAFE ACTION parameter. The FAILSAFE ACTION parameter (see Page 93) offers the following options:

- FSAFE VALUE
  The value defined in the FAILSAFE VALUE parameter (see Page 93) 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 factory setting is the setting (FAILSAFE VALUE) with value “0“.

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

25.7 Scaling the input value

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

Example:
- The system unit in the Transducer Block is m^3/h
- The measurement range of the device is 0...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 SCALING to the desired output range OUT_SCALE.

- PV_SCALE parameter group (see Page 93)

  PV_SCALE_MIN (V1H0) = 0

  PV_SCALE_MAX (V1H1) = 30

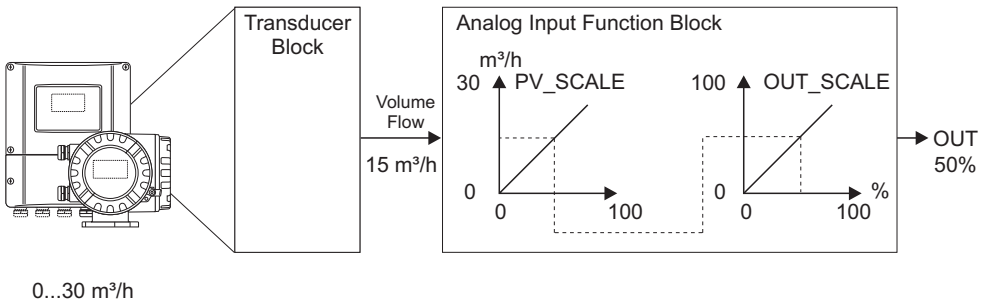
- OUT_SCALE parameter group (see Page 94)

  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 a value of 50% is output via the OUT VALUE parameter.



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Note!
The OUT_UNIT does not have any effect on the scaling. Nevertheless, it should be set for the purposes of viewing on the local operation, for example.

25.8 Limit values

You can set two early-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 96).

The limit values are based on the OUT VALUE. If the OUT VALUE 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 97)
- HI LIM (see Page 97)
- LO LO LIM (see Page 98)
- LO LIM (see Page 97)

25.9 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 ALARM (see Page 97)
  - HI ALARM (see Page 97)
  - LO LO ALARM (see Page 98)
  - LO ALARM (see Page 97)

25.10 Analog Input function block parameters

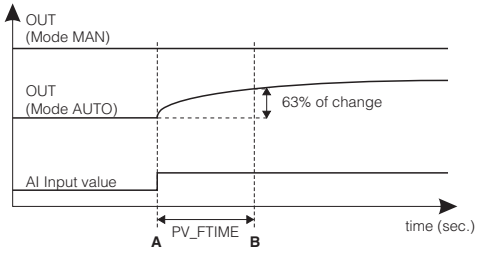
The following table shows all the parameters available for the Analog Input function block.

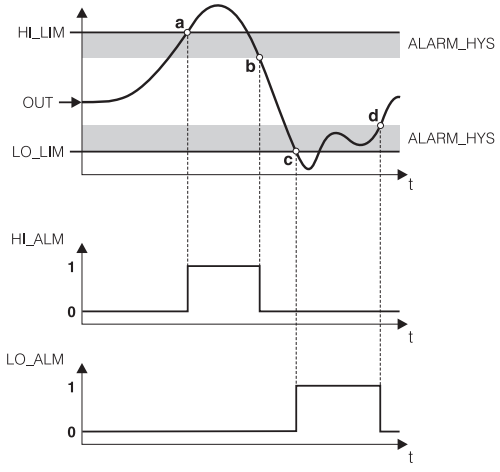
Abbreviations used in the table:
- R = Read
- W = Write
- P = Parameter, with a distinction between:
  - M = Mandatory parameter
  - O = Optional parameter

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
OUT (V0...)				
OUT VALUE (V0H0) *OUT (VALUE) (1...3/26)*	Displays the output value with alarm weighting. ✎ Note! If MAN (manual) is selected for the operating mode in the BLOCK MODE parameter group, the OUT VALUE can be specified manually here.	X		M
OUT STATUS (V0H1) *OUT (STATUS) (1...3/26)*	Displays the current output status. ✎ Note! If MAN (manual) is selected for the operating mode in the BLOCK MODE parameter group, the status of the OUT VALUE can be specified manually here.	X		M
OUT STATUS (V0H2) *OUT (STATUS BIT 0-1) (1...3/26)*	Displays the quality of the output status. **Display:** GOOD UNCERTAIN BAD	X		M
OUT SUB STATUS (V0H3) *OUT (STATUS BIT 2-5) (1...3/26)*	Displays the sub-status in plain text.	X		M
OUT LIMIT (V0H4) *OUT (LIMITS BIT 6-7) (1...3/26)*	Displays the limit overshoot in plain text. **Display:** O.K. → No limit overshoot HIGH LIMIT → HI LIM and / or HI HI LIM overshot LO LIMIT → LO LIM and / or LO LO LIM undershot	X		M

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
FAILSAFE ACTION (V0H6) *FSAFE_TYPE (1...3/33)*	Use this parameter to define error response in the event of a device error or bad measured value. The ACTUAL (the block's current operating mode) remains in AUTO (automatic mode). **Options:** ■ FSAFE VALUE If you select this option the value entered in the FAILSAFE VALUE parameter is displayed in the OUT VALUE (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 are not saved when the device is reset). The initial value of the Proline Prosonic Flow 90 PROFIBUS PA is "0". ■ WRONG VALUE The current value is used for processing, despite the bad status. **Factory setting:** FSAFE VALUE	X	X	O
FAILSAFE VALUE (V0H7) *FSAFE_VALUE (1...3/34)*	Use this parameter to enter a default value that will be displayed in the OUT VALUE (output value) in the event of an error (see FAILSAFE ACTION). **Factory setting:** 0	X	X	O
PV SCALING (V1...)	In this parameter group, the process variable is normalised to a value with the unit of the Transducer Block, with the aid of the PV SCALE MIN and PV SCALE MAX parameters. A change of unit in the Transducer Block also causes an automatic change in the scaling for the PV SCALE MIN and PV SCALE MAX parameters. This prevents OUT VALUE (output value) jumping. You will find an example of scaling the input value on Page 90.			
PV SCALE MIN (V1H0) *PV_SCALE (EU OF 0) (1...3/27)*	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...3/27)*	Use this parameter to enter the upper value for input scaling. **Factory setting:** 100	X	X	M
TYPE OF LIN (V1H2) *LIN_TYPE (1...3/29)*	Use this parameter to select a characteristic line to be used in characteristic-line transformation. ✎ Note! Linearisation cannot be set with Proline Prosonic Flow 90 PROFIBUS PA.	X	X	M

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
OUT SCALE	Use the OUT SCALE parameter group to define the measuring range (lower and upper limits) and the physical unit for the output value (OUT VALUE). ✎ Note! Defining the measurement range in this parameter group does not restrict the OUT VALUE. If the OUT VALUE is outside the measurement range, this value is transmitted nonetheless.			
OUT SCALE MIN (V1H3) *OUT_SCALE (EU OF 0%) (1...3/28)*	Use this parameter to select the lower value for output scaling. **Factory setting:** 0	X	X	M
OUT SCALE MAX (V1H4) *OUT_SCALE (EU OF 100%) (1...3/28)*	Use this parameter to enter the upper value for output scaling. **Factory setting:** 100	X	X	M
OUT UNIT (V1H5) *OUT_SCALE (1...3/28)*	Use this parameter to enter the output unit. **Factory setting:** Analog Input function block 1 = m^3/h Analog Input function block 2 = m/s Analog Input function block 3 = m/s ✎ Note! OUT UNIT (output unit) has no effect on measured-value scaling.	X	X	M
USER UNIT (V1H6) *OUT_UNIT_TEXT (1...3/51)*	Use this parameter to enter an ASCII text if the unit you want is not available in the OUT 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	O
DEC POINT OUT (V1H7) *OUT_SCALE (1...3/28)*	Use this parameter to define the decimal places of the OUT VALUE. ✎ Note! This parameter is not supported by the Proline Prosonic Flow 90 PROFIBUS PA.	X	X	M

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
RISING TIME (V1H8) *PV_FTIME (1...3/32)*	Entry of the filter time constant (in seconds) of the digital filter of the 1st order. This time is required in order for 63% of a change in the analog input (input value) to have an effect on the OUT VALUE (output value). The diagram shows the signal curves of the Analog Input function block over time:  F06-53PBxxxxx-05-xx-xx-en-003 **A** → The analog input (input value) changes. **B** → The OUT VALUE has reacted 63% to the change in the Analog Input. **Factory setting:** 0 s	X	X	M

Analog Input function block				
Matrix text (Commuwin II) *Parameter (SLOT/INDEX)*	**Description**	**R**	**W**	**P**
ALARM LIMITS (V2...)				
ALARM HYSTERESIS (V2H0) *ALARM_HYS (1...3/35)*	Entry of the hysteresis value for the upper and lower warning or alarm limit values. The alarm conditions remain active so long as the measured value is within the hysteresis. The hysteresis value affects the following warning and alarm limit values of the Analog Input function block: HI HI ALARM → Upper limit value alarm HI ALARM → Upper limit value warning LO LO ALARM → Lower limit value alarm LO ALARM → 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 94). ■ If you enter the limit values in Commuwin II, it is important to make sure that absolute values can be entered and displayed. Example: The top diagram shows the limit values defined for the warnings LO LIM and HI LIM with their respective hystereses (gray background) and the signal curve of the OUT VALUE. The bottom two diagrams show the behaviour of the associated alarms HI ALARM and LO ALARM in relation to the changing signal curve (0 = no alarm, 1 = alarm output). **a** → OUT VALUE exceeds the limit value HI LIM → HI ALARM is activated. **b** → OUT VALUE undershoots the hysteresis value of HI LIM → HI ALARM is deactivated. **d** → OUT VALUE undershoots the limit value LO LIM → LO ALARM is activated. **e** → OUT VALUE exceeds the hysteresis value of LO LIM → LO ALARM is deactivated.  F06-53xFFxxxx-05-xx-xx-en-002	X	X	M

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
HI HI ALARM (V3...)				
HI HI LIM (V3H0) *HI_HI_LIM (1...3/37)*	Entry of the alarm limit value for the upper alarm (HI HI ALARM). If the OUT VALUE exceeds this limit value, the alarm status parameter HI HI ALARM 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...3/46)*	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...3/46)*	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...3/46)*	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...3/46)*	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...3/39)*	Entry of the alarm limit value for the upper alarm (HI ALARM). If the OUT VALUE exceeds this limit value, the alarm status parameter HI ALARM 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...3/47)*	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...3/47)*	Use this parameter to view the current status of the HI ALARM.	X		O
SWITCH-ON POINT (V4H3) *HI_ALM (SWITCH-ON POINT) (1...3/47)*	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...3/47)	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
LO ALARM (V5...)				
LO LIM (V5H0) *LO_LIM (1...3/41)*	Entry of the alarm limit value for the lower warning (LO ALARM). If the OUT VALUE undershoots this limit value, the alarm status parameter LO ALARM 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...3/48)*	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...3/48)*	Use this parameter to view the current status of the LO ALARM.	X		O

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
SWITCH-ON POINT (V5H3) *LO_ALM (SWITCH-ON POINT) (1...3/48)*	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...3/48)*	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...3/43)*	Entry of the alarm limit value for the lower warning (LO LO ALARM). If the OUT VALUE undershoots this limit value, the alarm status parameter 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...3/49)*	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...3/49)*	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...3/49)*	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...3/49)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
SIMULATION (V7...)				
SIMULATION VALUE (V7H0) *SIMULATE (1...3/50)*	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...3/50)*	Use this parameter to simulate the status of the Analog Input (AI) Block.	X	X	O
SIMULATION MODE (V7H2) *SIMULATE (MODE)*	Use this parameter to activate simulation of the Analog Input function block. **User input:** OFF ON **Factory setting:** OFF	X	X	O

Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
BLOCK MODE (V8...)	**General information on the MODE_BLK parameter group:** There are three elements in this parameter group: ■ The current operating mode of the block (Actual_Mode) ■ The modes supported by the block (Permitted_Mode) ■ The normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the "out-of-service" (O/S) mode. 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...3/21)*	Select the operating mode. **Options:** AUTO MAN O/S **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLK (ACTUAL) (1...3/22)*	Displays the current operating mode. **Display:** AUTO	X		M
NORMAL (V8H2) *MODE_BLK (NORMAL) (1...3/22)*	Displays the operating mode for normal operation. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLK (PERMITTED) (1...3/22)*	Displays the permissible operating modes. **Display:** AUTO	X		M
CHANNEL (V8H5) *CHANNEL (1...3/30)*	Use this parameter for assignment between the logical hardware channel of the Transducer Block and the input of the Analog Input function block. The Transducer Block of the Proline Prosonic Flow 90 PROFIBUS PA makes three process variables available to the input channels of the Analog Input function block. They are: **AI 1** (Analog Input 1) → Volume flow **AI 2** (Analog Input 2) → Sound velocity **AI 3** (Analog Input 3) → Flow velocity ✎ Note! In the Proline Prosonic Flow 90 PROFIBUS PA the channels are permanently assigned and the settings cannot be changed via the CHANNEL parameter.	X	X	M
UNIT MODE (V8H7)	Use this parameter to select the form in which you want the units displayed. In the **list** mode the units are displayed with the conventional abbreviations, for example: l/s. In the **number** mode the units are displayed in the numerical code defined in the 3.0 profiles, for example: 1351 (l/s).			

Analog Input function block				
Matrix text (Commuwin II) *Parameter (SLOT/INDEX)*	**Description**	**R**	**W**	**P**
ALARM CONFIG (V9...)	**General information on the ALARM CONFIG parameter group:** The block supported is the Active Block Alarm, which flags a change in a parameter with static parameters (Static attribute) for 10 seconds and indicates that an early-warning limit or an alarm limit has been violated in an Analog Input function block.			
CURRENT (V9H0) *ALARM_SUM (CURRENT) (1...3/23)*	Use this parameter to view the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUM (DISABLE) (1...3/23)*	Use this parameter to view the acknowledged alarms of the measuring device.	X		M
ST REVISION (V9H5) *ST_REV (1...3/17)*	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 value 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...3/18)*	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...3/19)*	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...3/20)*	For entering the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3)	Displays the profile version implemented in the device. **Display:** 30			

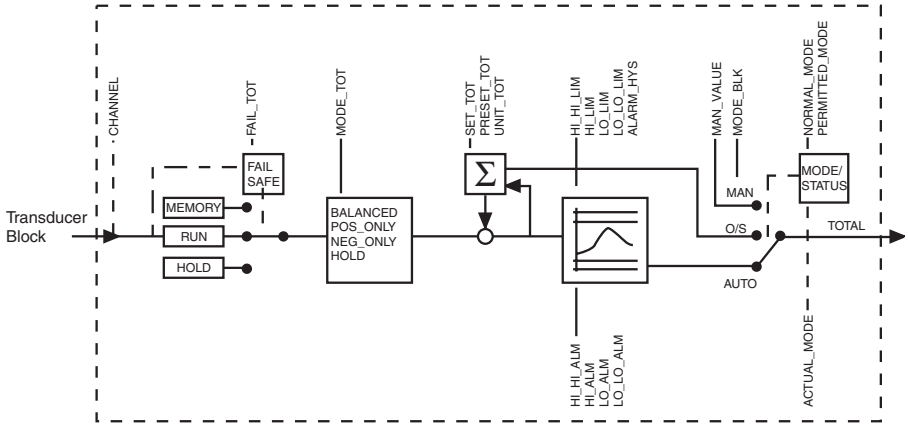
Analog Input function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
BATCH (VAH4-7)	Batch is a structured parameter consisting of four elements. This parameter is used in batch applications in accordance with EC 61512 Part 1 (ISA S88). Only function 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. In addition, the errors that have occurred in the current batch process can be displayed.			
BATCH ID (VAH4) *BATCH (ID) (1...3/24)*	ID of a batch application as a means of assigning device messages (alarms, errors).	X	X	M
BATCH RUP (VAH5) *BATCH (RUP) (1...3/24)*	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...3/24)*	Use this parameter to write or show the current formula phase.	X	X	M
BATCH OPERATION (VAH7) *BATCH (OPERATION) (1...3/24)*	Use this parameter to write or show the current formula.	X	X	M

26 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.
This is the volume flow with Proline Prosonic Flow 90 PROFIBUS PA.
Like the Analog Input function block, the totalizer receives its input value from a Transducer Block.

26.1 Signal processing

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



F06-53PBxxxx-05-xx-xx-de-005

The Totalizer function block receives its input value (volume flow measured variable) from the Transducer Block.
The CHANNEL parameter (see Page 111) is used to select whether the input value should be processed by the Totalizer function block. The following settings can be made with Commuwin II and via local operation:

- Local operation:
  – OFF
  – VOLUME FLOW

- Commuwin II:
  – 273 (volume flow)

The BLOCK MODE parameter group (Page 99) is used to select the operating mode of the Totalizer function block. If the MAN (manual) operating mode is selected, the output value TOTAL. VALUE and the TOTAL. STATUS can be specified directly.

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

The output value TOTAL. VALUE 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 then a limit value process alarm (e.g. HI ALARM,LO LO ALARM, etc.) is triggered.

The most important functions and parameters of the Totalizer function block are listed below. An overview of all the parameters available is provided from Page 105 onwards.

26.2 Selecting the operating mode, TARGET MODE

The operating mode is set by means of the BLOCK MODE parameter group (see Page 110). The Totalizer function block supports the following operating modes:
- AUTO (automatic mode)
- MAN (manual mode)
- O/S (out of service)

26.3 Unit of the totalled measured value, TOTAL. UNIT

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.

26.4 Status of the output value, TOTAL. STATUS

The status of the Totalizer function block and the validity of the output value, i.e. its status TOTAL. STATUS, is relayed to the downstream function blocks by means of the status of the TOTALIZER parameter group. The following status values can be displayed:

- GOOD_NON_CASCADE
  The output value TOTAL. VALUE is valid and can be used for further processing.

- UNCERTAIN
  The output value TOTAL. VALUE can only be used for further processing to a limited extent.

- BAD
  The output value TOTAL. VALUE 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 Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en).

26.5 Error response, FAILSAFE MODE

If an input value is statused BAD, the Totalizer function block uses the response defined in the FAILSAFE MODE parameter (see Page 106). The following error response options are available:
- 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 FAILSAFE MODE parameter.

26.6 Selecting the direction for totalling, TOTALIZER MODE

Use the TOTALIZER MODE parameter (see Page 107) to define the direction in which the totalizer totals. 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 following settings are possible in the TOTALIZER MODE parameter:
- 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 TOTALIZER MODE parameter.

You will find information on integration into an automation system in the examples dealing with system integration and configuration in the Operating Instructions Proline Prosonic Flow 90, PROFIBUS PA, BA074D/06/en/.

26.7 Setting for the totalizer, SET TOTALIZER

The following settings are possible in the SET TOTALIZER parameter (see Page 106):
- 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 TOTALIZER 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 TOTALIZER MODE parameter.

TOTALIZER is activated in the factory setting for the SET TOTALIZER parameter.

You will find information on integration into an automation system in the examples dealing with system integration and configuration in the Operating Instructions Proline Prosonic Flow 90 PROFIBUS PA, BA 074D/06/en.

26.8 Limit values

You can set two early-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 108).

The limit values are based on the output value TOTAL. VALUE. If the output value TOTAL. VALUE 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 109)	– HI LIM	(see Page 109)
– LO LO LIM	(see Page 110)	– LO LIM	(see Page 109)

26.9 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 ALARM (see Page 109)
  - HI ALARM (see Page 109)
  - LO LO ALARM (see Page 110)
  - LO ALARM (see Page 109)

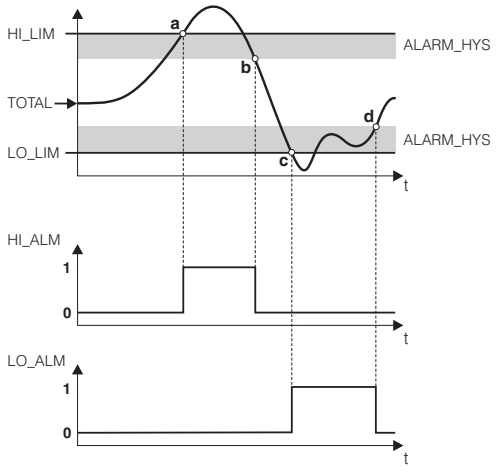
26.10 Totalizer function block parameters

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**
TOTALIZER (V0...)				
TOTAL. VALUE (V0H0) *TOTAL (Value) (4/26)*	Displays the output value (TOTAL. VALUE) with alarm weighting. ✎ Note! If MAN (manual) is selected for the operating mode in the BLOCK MODE parameter group, the output value TOTAL. VALUE can be specified manually here.	X		M
TOTAL. STATUS (V0H1) *TOTAL (Status) (4/26)*	Displays the current output status (TOTAL. STATUS). ✎ Note! If MAN (manual) is selected for the operating mode in the BLOCK MODE parameter group, the status of the output value TOTAL. VALUE can be specified manually here.	X		M
TOTAL. STATUS (V0H2) *TOTAL (Status Bit 0-1) (4/26)*	Displays the quality of the output status. **Display:** GOOD NOT CASC. UNCERTAIN BAD	X		M
TOTAL. SUB STATUS (V0H3) *TOTAL (Status Bit 2-5) (4/26)*	Displays the sub-status in plain text.	X		M
TOTAL. LIMIT (V0H4) *TOTAL (Limits Bit 6-7) (4/26)*	Displays the limit overshoot in plain text. **Display:** O.K. → No limit overshoot HIGH LIMIT → HI LIM and/or HI HI LIM overshot LO LIMIT → LO LIM and/or LO LO LIM undershot	X		M

Totalizer function block				
Matrix text (Commuwin II) *Parameter (SLOT/INDEX)*	**Description**	**R**	**W**	**P**
FAILSAFE MODE (V0H6) *FAIL_TOT (4/31)*	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	X	X	M
CONFIGURATION (V1...)				
TOTAL. UNIT (V1H0) *UNIT_TOT (4/27)*	Select the unit for the measured variable. **Options:** Metric → cm^3; dm^3; m^3; ml; l; hl; Ml US → ft^3 (cft); gal; bbl Imperial → gal **Factory setting (volume):** m^3	X	X	M
SET TOTALIZER (V1H1) *SET_TOT (4/29)*	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 TOTALIZER parameter. **Factory setting:** TOTALIZE	X	X	M
PRESET TOTALIZER (V1H2) *PRESET_TOT (4/32)*	Use this parameter to define a start value for the totalizer. The totalizer does not accept this value unless the PRESET option was selected in the SET TOTALIZER parameter. ✎ Note! The start value can only be specified via local operation or via a Class 2 master. **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 (4/30)*	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:** BALANCED	X	X	M

Totalizer function block				
Matrix text (Commuwin II) *Parameter (SLOT/INDEX)*	**Description**	**R**	**W**	**P**
ALARM LIMITS (V2...)				
ALARM HYSTERESIS (V2H0) *ALARM_HYS (4/33)*	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 ALARM (upper limit value alarm) ■ HI ALARM (upper limit value warning) ■ LO LO ALARM (lower limit value alarm) ■ LO ALARM (lower limit value warning) **User input:** 0...50% **Factory setting:** 0.5% Example: The top diagram shows the limit values defined for the warnings LO LIM and HI LIM with their respective hystereses (gray background) and the signal curve of the output value TOTAL. VALUE. The bottom two diagrams show the behaviour of the associated alarms HI ALARM and LO ALARM in relation to the changing signal curve (0 = no alarm, 1 = alarm output). **a** = TOTAL. VALUE exceeds the limit value HI LIM, the HI ALARM (VALUE) is activated. **b** = TOTAL. VALUE undershoots the hysteresis value of HI LIM, the HI ALARM (VALUE) is deactivated. **c** = TOTAL. VALUE undershoots the limit value LO LIM, the LO ALARM (VALUE) is activated. **d** = TOTAL. VALUE exceeds the hysteresis value of LO LIM, the LO ALARM (VALUE) is deactivated.  F06-50PBxxxx-05-xx-xx-de-007	X	X	M

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
HI HI ALARM (V3...)				
HI HI LIM (V3H0) *HI_HI_LIM (4/33)*	Entry of the alarm limit value for the upper alarm (HI HI ALARM). If the output value TOTAL. VALUE exceeds this limit value, the alarm status parameter HI HI ALARM is output. **User input:** Range of TOTAL **Factory setting:** $3402823466 \times 10^{38}$	X	X	M
VALUE (V3H1) *HI_HI_ALM (VALUE) (4/38)*	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) (4/38)*	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) (4/38)*	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) (4/38)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
HI ALARM (V4...)				
HI LIM (V4H0) *HI_LIM (4/35)*	Entry of the alarm limit value for the upper alarm (HI ALARM). If the output value TOTAL. VALUE exceeds this limit value, the alarm status parameter HI ALARM is output. **User input:** Range of TOTAL **Factory setting:** $3402823466 \times 10^{38}$	X	X	M
VALUE (V4H1) *HI_ALM (VALUE) (4/39)*	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) (4/39)*	Use this parameter to view the current status of the HI ALARM.	X		O
SWITCH-ON POINT (V4H3) *HI_ALM (SWITCH-ON POINT) (4/39)*	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) (4/39)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
LO ALARM (V5...)				
LO LIM (V5H0) *LO_LIM (4/36)*	Entry of the alarm limit value for the lower warning (LO ALARM). If the output value TOTAL. VALUE undershoots this limit value, the alarm status parameter LO ALARM is output. **User input:** Range of TOTAL **Factory setting:** $3402823466 \times 10^{38}$	X	X	M
VALUE (V5H1) *LO_ALM (VALUE) (4/40)*	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) (4/40)*	Use this parameter to view the current status of the LO ALARM.	X		O

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
SWITCH-ON POINT (V5H3) *LO_ALM (SWITCH-ON POINT) (4/40)*	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) (4/40)*	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 (4/37)*	Entry of the alarm limit value for the lower warning (LO LO ALARM). If the output value TOTAL. VALUE undershoots this limit value, the alarm status parameter LO LO ALARM is output. **User input:** Range of TOTAL **Factory setting:** 3402823466 x 10^{38}	X	X	M
VALUE (V6H1) *LO_LO_ALM (VALUE) (4/41)*	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) (4/41)*	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) (4/41)*	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) (4/41)*	Use this parameter to view the switch-off point as a function of hysteresis.	X		O
BLOCK MODE (V8...)	**General information on the MODE_BLK parameter group:** There are three elements in this parameter group: ■ The current operating mode of the block (Actual_Mode) ■ The modes supported by the block (Permitted_Mode) ■ The normal operating mode (Normal_Mode) A distinction is drawn between automatic operation (AUTO), manual user intervention (MAN), local override (LO) and the "out-of-service" (O/S) mode. 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 (4/21)*	Select the operating mode. **Options:** AUTO – MAN – O/S **Factory setting:** AUTO	X	X	M
ACTUAL (V8H1) *MODE_BLK (ACTUAL) (4/22)*	Displays the current operating mode. **Display:** AUTO	X		M
NORMAL (V8H2) *MODE_BLK (NORMAL) (4/22)*	Displays the operating mode for normal operation. **Display:** AUTO	X		M
PERMITTED (V8H3) *MODE_BLK (PERMITTED) (4/22)*	Displays the permissible operating modes. **Display:** AUTO	X		M

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
CHANNEL (V8H5) *CHANNEL (4/28)*	Use this parameter for assignment between the logical hardware channel of the Transducer Block and the input of the Totalizer Block. The Transducer Block of the Proline Prosonic Flow 90 PROFIBUS PA makes a process variable available to the input channel of the Totalizer function block. **Options:** OFF VOLUME FLOW	X	X	M
UNIT MODE (V8H7)	Use this parameter to select the form in which you want the units displayed. ■ In the **list** mode the units are displayed with the conventional abbreviations, for example: l/s. ■ In the **number** mode the units are displayed in the numerical code defined in the 3.0 profiles, for example: 1034 (l/s).			
ALARM CONFIG (V9...)	**General information on the ALARM CONFIG parameter group:** 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_SUM (CURRENT) (4/23)*	Use this parameter to view the current alarms of the measuring device.	X		M
DISABLE (V9H1) *ALARM_SUM (DISABLE) (4/23)*	Use this parameter to view the acknowledged alarms of the measuring device.	X		M
ST REVISION (V9H5) *ST_REV (4/17)*	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 device from Commuwin II. This counter is never reset, nor does it return to a default value even after a device reset. If the counter overflows (16 bits), it restarts at 0.	X		M
BLOCK PARAMETER (VA...)				
TAG (VAH0) *TAG_DESC (4/18)*	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 (4/19)*	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

Totalizer function block				
Matrix text (Commuwin II) ***Parameter (SLOT/INDEX)***	**Description**	**R**	**W**	**P**
ALERT KEY (VAH2) *ALERT_KEY (4/20)*	For entering the identification number of the plant unit. This information can be used by the instrumentation and control system for sorting alarms and events. **User input:** 1...255 **Factory setting:** 0	X	X	M
PROFILE VERSION (VAH3)	Displays the profile version implemented in the device. **Display:** 30			
BATCH (VAH4-7)	Batch is a structured parameter consisting of four elements. This parameter is used in batch applications in accordance with EC 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. In addition, the errors that have occurred in the current batch process can be displayed.			
BATCH ID (VAH4) *BATCH (ID) (4/24)*	ID of a batch application as a means of assigning device messages (alarms, errors).	X	X	M
BATCH RUP (VAH5) *BATCH (RUP) (4/24)*	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) (4/24)*	Use this parameter to write or show the current formula phase.	X	X	M
BATCH OPERATION (VAH7) *BATCH (OPERATION) (4/24)*	Use this parameter to write or show the current formula.	X	X	M

27 Slot/Index lists

27.1 General explanatory remarks

Abbreviations used in the Slot/Index lists:
- E+H Matrix → Number of the page on which you find the explanation of the parameter. Parameter fields in a gray ■ 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 Unsigned8, 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

27.2 Physical Block slot 0

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Physical Block slot 0									
not used	–	0-15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 52	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 52	18	X	X	Simple	M	Octet String	32	S
STRATEGY	P. 52	19	X	X	Simple	M	Unsigned16	2	S
ALERT_KEY	P. 52	20	X	X	Simple	M	Unsigned8	1	S
TARGET_MODE	P. 51	21	X	X	Simple	M	Unsigned8	1	S
MODE_BLK	P. 51	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 52	23	X	–	Record	M	DS-42	8	D
SOFTWARE_VERSION	P. 48	24	X	–	Simple	M	Octet String	16	Cst
HARDWARE_VERSION	P. 48	25	X	–	Simple	M	Octet String	16	Cst
DEVICE_MAN_ID	P. 49	26	X	–	Simple	M	Unsigned16	2	Cst
DEVICE_ID	P. 48	27	X	–	Simple	M	Octet String	16	Cst
DEVICE_SER_NUM	P. 48	28	X	–	Simple	M	Octet String	16	Cst
DIAGNOSIS	P. 51	29	X	–	Simple	M	Octet String	4	D
DIAGNOSIS_EXT	P. 51	30	X	–	Simple	O	Octet String	6	D

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Physical Block slot 0									
DIAGNOSIS_MASK	P. 50	31	X	–	Simple	M	Octet String	4	Cst
DIAGNOSIS_MASK_EXTENS	P. 51	32	X	–	Simple	O	Octet String	6	Cst
DEVICE_CERTIFICATION	P. 49	33	X	–	Simple	O	Octet String	32	Cst
WRITE_LOCKING	P. 49	34	X	X	Simple	O	Unsigned16	2	N
FACTORY_RESET	P. 49	35	X	X	Simple	O	Unsigned16	2	S
DESCRIPTOR	P. 49	36	X	X	Simple	O	Octet String	32	S
DEVICE_MESSAGE	P. 49	37	X	X	Simple	O	Octet String	32	S
DEVICE_INSTAL_DATE	P. 49	38	X	X	Simple	O	Octet String	16	S
not used	–	39	–	–	–	–	–	–	–
IDENT_NUMBER_SELECTOR	P. 50	40	X	X	Simple	O	Unsigned8	1	S
HW_WRITE_PROTECTION	P. 50	41	X	–	Simple	O	Unsigned8	1	D
not used	–	42-48	–	–	–	–	–	–	–
ACTUAL_ERROR_CODE	P. 79	49	X	–	Simple	O	Unsigned16	2	D
not used	–	50	–	–	–	–	–	–	–
UPDOWN_FEAT_SUPP	–	51	X	–	Simple	M	Octet String	1	Const
UPDOWN_CONT_PARA	–	52	X	X	Simple	O	Unsigned8	1	D
UPDOWN_PARA	–	53	X	X	Record	O	UpDown Data	20	D
DEV_BUS_ADDR	P. 65	54	X	–	Simple	O	Unsigned8	1	D
not used	–	55	–	–	–	–	–	–	–
SET_UNIT_TO_BUS	P. 64	56	X	X	Simple	O	Unsigned8	1	N
LOCAL_DISPLAY_INPUT	P. 65	57	X	–	Record	O	DS-33	5	D
not used	–	58	–	–	–	–	–	–	–
MEASID	–	59	X	–	Simple	O	Unsigned8	1	D
SERIAL_NUM	P. 82	60	X	X	Simple	O	OctetString	16	S
SENSOR_TYPE	–	61	X	X	Simple	O	OctetString	16	S
HW_REV_SENSOR	–	62	X	X	Simple	O	OctetString	16	S
HW_IDENT_SENSOR	–	63	X	X	Simple	O	OctetString	16	S
PROD_NUM_SENSOR	–	64	X	X	Simple	O	OctetString	16	S
SW_REV_S_DAT	–	65	X	X	Simple	O	OctetString	16	S
HW_REV_AMP	–	66	X	X	Simple	O	OctetString	16	S
HW_IDENT_AMP	–	67	X	X	Simple	O	OctetString	16	S
SW_REV_AMP	P. 82	68	X	X	Simple	O	OctetString	16	S
SW_IDENT_AMP	–	69	X	X	Simple	O	OctetString	16	S
PROD_NUM_AMP	–	70	X	X	Simple	O	OctetString	16	S
IO_TYPE	P. 82	71	X	–	Simple	O	Unsigned8	1	N
HW_REV_IO	–	72	X	X	Simple	O	OctetString	16	S
HW_IDENT_IO	–	73	X	X	Simple	O	OctetString	16	S
SW_REV_IO	P. 82	74	X	X	Simple	O	OctetString	16	S
SW_IDENT_IO	–	75	X	X	Simple	O	OctetString	16	S
PROD_NUM_IO	–	76	X	X	Simple	O	OctetString	16	S
SW_REV_T_DAT	–	77	X	X	Simple	O	OctetString	16	S
HMI_LANGUAGE	P. 75	78	X	X	Simple	O	Unsigned8	1	S
HMI_DAMPING	P. 75	79	X	X	Simple	O	Float	4	S
HMI_LCD_CONTRAST	P. 76	80	X	X	Simple	O	Float	4	S
HMI_LCD_BACKLIGHT	P. 76	81	X	X	Simple	O	Float	4	S
not used	–	82 - 83	–	–	–	–	–	–	–
PREV_SYS_COND	P. 79	84	X	–	Simple	O	Unsigned16	2	D

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Physical Block slot 0									
not used	–	85 - 87	–	–	–	–	–	–	–
TROUBLESHOOTING	P. 79	88	X	X	Simple	O	Unsigned8	1	S
OPERATION_HOURS	–	89	X	–	Simple	O	Unsigned8	1	N
not used	–	90 - 99	–	–	–	–	–	–	–
ACCESS_CODE_COUNTER	–	100	X	–	Simple	O	Unsigned8	1	N
CYCL_CALC_TOT	–	101	X	X	Simple	O	Unsigned8	1	S
not used	–	102 - 103	–	–	–	–	–	–	–
HMI_MAIN_L_ASSIGN	P. 76	104	X	X	Simple	O	Unsigned8	1	S
HMI_MAIN_L_100_VALUE	P. 76	105	X	X	Simple	O	Float	4	S
HMI_MAIN_L_FORMAT	P. 77	106	X	X	Simple	O	Unsigned8	1	S
HMI_ASSIGN_LINE_2	P. 77	107	X	X	Simple	O	Unsigned8	1	S
not used	–	108 - 139	–	–	–	–	–	–	–
VIEW_PHYSICAL BLOCK	–	140	X	X	Simple	M	Unsigned16,DS-37, DS-42,Octet String[4]	17	D
not used	–	141 - 143	–	–	–	–	–	–	–

27.3 Device management slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Device Management slot 1									
Directory_Header / Composite_Directory_Entries	–	0	X	–	Record	M	Unsigned16	12	C
Composite_Directory_Entry / Composite_Directory_Entries	–	1	X	–	Record	M	Unsigned16	36*/32**	C
not used	–	2 - 15	–	–	–	–	–	–	–
* manufacturer-specific ** profile-specific									

27.4 Transducer Block slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Transducer Block slot 1									
BLOCK_OBJECT	–	70	X	–	Record	M	DS-32	20	C
ST_REV	P. 86	71	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 86	72	X	X	Simple	M	OctetString	32	S
STRATEGY	P. 86	73	X	X	Simple	M	Unsigned16	2	S
ALERT_KEY	P. 86	74	X	X	Simple	M	Unsigned8	1	S
TARGET_MODE	P. 85	75	X	X	Simple	M	Unsigned8	1	S
MODE_BLK	P. 85	76	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 86	77	X	–	Record	M	DS-42	8	D
CALIBR_FACTOR	P. 85	78	X	X	Simple	M	float	4	S
LOW_FLOW_CUTOFF	P. 58	79	X	X	Simple	M	float	4	S
MEASUREMENT_MODE	P. 66	80	X	X	Simple	M	Unsigned8	1	S

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Transducer Block slot 1									
FLOW_DIRECTION	P. 84	81	X	X	Simple	M	Unsigned8	1	S
ZERO_POINT	P. 84	82	X	X	Simple	M	float	4	S
ZERO_POINT_ADJUST	P. 62	83	X	X	Simple	M	Unsigned8	1	N
ZERO_POINT_UNIT	P. 84	84	X	X	Simple	M	Unsigned16	2	S
NOMINAL_SIZE	P. 85	85	X	X	Simple	M	float	4	S
NOMINAL_SIZE_UNIT	P. 57	86	X	X	Simple	M	Unsigned16	2	S
VOLUME_FLOW	P. 55	91	X	–	Record	M	DS-33	5	D
VOLUME_FLOW_UNIT	P. 56	92	X	X	Simple	M	Unsigned16	2	S
VOLUME_FLOW_LO_LIMIT	P. 83	93	X	X	Simple	M	float	4	S
VOLUME_FLOW_HI_LIMIT	P. 83	94	X	X	Simple	M	float	4	S
not used	–	91 - 106	–	–	–	–	–	–	–
SOUND_VELOCITY	P. 55	107	X	–	Record	M	DS-33	5	D
SOUND_VELOCITY_UNIT	P. 56	108	X	X	Simple	M	Unsigned16	2	S
SOUND_VELOCITY_LO_LIMIT	P. 84	109	X	X	Simple	M	float	4	S
SOUND_VELOCITY_HI_LIMIT	P. 84	110	X	X	Simple	M	float	4	S
not used	–	111 - 122	–	–	–	–	–	–	–
FLOW_VELOCITY	P. 55	123	X	–	Record	O	DS-33	5	D
SIGNAL_STRENGTH	P. 55	124	X	–	Simple	O	Float	4	N
not used	–	125 - 130	–	–	–	–	–	–	–
TEMP_UNIT	P. 57	131	X	X	Simple	O	Unsigned16	2	S
VISCOSITY_UNIT	P. 56	132	X	X	Simple	O	Unsigned16	2	S
not used	–	133	–	–	–	–	–	–	–
LOCK_ACCESS_CODE	P. 57	134	X	X	Simple	O	Signed16	2	N
LOCK_PRIVATE_CODE	P. 58	135	X	X	Simple	O	Signed16	2	S
LOCK_ACCESS_STATUS	P. 58	136	X	–	Simple	O	Unsigned8	1	D
not used	–	137 - 142	–	–	–	–	–	–	–
PROFIBUS_BLOCK_SELECTION	P. 64	143	X	X	Simple	O	Unsigned8	1	S
PROFIBUS_OUT_VALUE	P. 64	144	X	–	Record	O	DS-33	5	N
PROFIBUS_ACTUAL_BAUDRATE	P. 65	145	X	–	Simple	O	Unsigned8	1	N
PROFIBUS_CHECK_CONFIG	P. 66	146	X	–	Simple	O	Signed16	2	N
PROFIBUS_DEVICE_ID	P. 66	147	X	–	Simple	O	Unsigned8	1	N
not used	–	148 - 150	–	–	–	–	–	–	–
LOW_FLOW_CUTOFF_ASSIGN	P. 58	151	X	X	Simple	O	Unsigned8	1	S
LOW_FLOW_CUTOFF_OFF_VALUE	P. 59	152	X	X	Simple	O	Float	4	S
not used	–	153 - 154	–	–	–	–	–	–	–
PIPE_STANDARD	P. 59	155	X	X	Simple	O	Unsigned8	1	S
NOMINAL_DIAMETER	P. 60	156	X	X	Simple	O	Unsigned8	1	S
PIPE_MATERIAL	P. 60	157	X	X	Simple	O	Unsigned8	1	S
not used	–	158	–	–	–	–	–	–	–
SOUND_VELOCITY_PIPE	P. 60	159	X	X	Simple	O	Float	4	S
CIRCUMFERENCE	P. 61	160	X	X	Simple	O	Float	4	N
PIPE_DIAMETER	P. 61	161	X	X	Simple	O	Float	4	N
WALL_THICKNESS	P. 61	162	X	X	Simple	O	Float	4	N
LINER_MATERIAL	P. 62	163	X	X	Simple	O	Unsigned8	1	S
SOUND_VELOCITY_LINER	P. 63	164	X	X	Simple	O	Float	4	S
LINER_THICKNESS	P. 63	165	X	X	Simple	O	Float	4	S
SOUND_VELOCITY_PIPE_LONGI	–	166	X	X	Simple	O	Float	4	S

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Transducer Block slot 1									
LIQUID	P. 67	167	X	X	Simple	O	Unsigned8	1	S
LIQUID_TEMPERATURE	P. 67	168	X	X	Simple	O	Float	4	S
LIQUID_SOUND_VELOCITY	P. 68	169	X	X	Simple	O	Float	4	S
LIQUID_VISCOSITY	P. 68	170	X	X	Simple	O	Float	4	S
MIN_SOUND_VELOCITY_LIQUID	P. 69	171	X	X	Simple	O	Float	4	S
MAX_SOUND_VELOCITY_LIQUID	P. 69	172	X	X	Simple	O	Float	4	S
not used	–	173	–	–	–	–	–	–	–
SYSTEM_FLOW_DAMPING	P. 66	174	X	X	Simple	O	Float	4	S
SYSTEM_POSITIVE_ZERO_RETURN	P. 67	175	X	X	Simple	O	Unsigned8	1	N
not used	–	176	–	–	–	–	–	–	–
SENSOR_MEASUREMENT	P. 66	177	X	X	Simple	O	Unsigned8	1	S
SENSOR_TYPE	P. 71	178	X	X	Simple	O	Unsigned8	1	S
SENSOR_CONFIG	P. 71	179	X	X	Simple	O	Unsigned8	1	S
SENSOR_CABLE_LENGTH	P. 71	180	X	X	Simple	O	Unsigned8	1	S
SENSOR_POSITION	P. 71	181	X	–	Simple	O	String	16	N
SENSOR_WIRE_LENGTH	P. 72	182	X	X	Simple	O	Float	4	S
SENSOR_DISTANCE	P. 72	183	X	X	Simple	O	Float	4	S
SENSOR_ARC_LENGTH	–	184	X	X	Simple	O	Float	4	S
SENSOR_PATH_LENGTH	P. 72	185	X	X	Simple	O	Float	4	S
SENSOR_P_FACTOR	P. 72	186	X	X	Simple	O	Float	4	S
SENSOR_ZERO_POINT	P. 72	187	X	X	Simple	O	Float	4	S
SENSOR_CORRECTION_FACTOR	P. 72	188	X	X	Simple	O	Float	4	S
SENSOR_DEV_SENSOR	P. 73	189	X	X	Simple	O	Float	4	S
SENSOR_DEV_ARC_LENGTH	–	190	X	X	Simple	O	Float	4	S
SENSOR_DEV_PATH_LENGTH	P. 73	191	X	X	Simple	O	Float	4	S
SENSOR_REYNOLDS_NUMBER	–	192	X	X	Simple	O	Float	4	S
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	S
SRV_RCV_FREQUENCY	–	199	X	X	Simple	O	Float	4	S
SRV_REASON_FREQUENCY	–	200	X	X	Simple	O	Float	4	S
SRV_BURST_VOLTAGE	–	201	X	X	Simple	O	Float	4	S
SRV_GAIN_AMP	–	202	X	X	Simple	O	Float	4	S
SRV_STATUS_AMP	–	203	X	X	Simple	O	Float	4	S
not used	–	204	–	–	–	–	–	–	–
DIAG_ALARM_DELAY	P. 79	205	X	X	Simple	O	Float	4	S
SYSTEM_RESET	P. 79	206	X	X	Simple	O	Unsigned8	1	N
not used	–	207	–	–	–	–	–	–	–
SIM_MEASURAND	P. 81	208	X	X	Simple	O	Unsigned8	1	N
SIM_VALUE	P. 81	209	X	X	Simple	O	Float	4	N
SIM_FSAFE_MODE	P. 82	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

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Transducer Block slot 1									
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	–	223	X	X	Simple	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	–	–	–	–	–	–	–

27.5 AI 1 Volume flow block slot 1

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
AI 1 - Volume Flow - slot 1									
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 100	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 100	18	X	X	Simple	M	Octet String	32	S
STRATEGY	P. 100	19	X	X	Simple	M	Unsigned16	2	S
ALERT_KEY	P. 100	20	X	X	Simple	M	Unsigned8	1	S
TARGET_MODE	P. 99	21	X	X	Simple	M	Unsigned8	1	S
MODE_BLK	P. 99	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 100	23	X	–	Record	M	DS-42	8	D
BATCH	P. 101	24	X	X	Record	M	DS -67	10	S
not used	–	25	–	–	–	–	–	–	–
OUT	P. 92	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 93	27	X	X	Array	M	Float	8	S
OUT_SCALE	P. 94	28	X	X	Record	M	DS-36	11	S
LIN_TYPE	P. 93	29	X	X	Simple	M	Unsigned8	1	S
CHANNEL	P. 99	30	X	X	Simple	M	Unsigned16	2	S
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 95	32	X	X	Simple	M	Float	4	S
FSAFE_TYPE	P. 93	33	X	X	Simple	O	Unsigned8	1	S
FSAFE_VALUE	P. 93	34	X	X	Simple	O	Float	4	S
ALARM_HYS	P. 96	35	X	X	Simple	M	Float	4	S
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 97	37	X	X	Simple	M	Float	4	S
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 97	39	X	X	Simple	M	Float	4	S
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 97	41	X	X	Simple	M	Float	4	S
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 98	43	X	X	Simple	M	Float	4	S
not used	–	44 - 45	–	–	–	–	–	–	–

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
AI 1 - Volume Flow - slot 1									
HI_HI_ALM	P. 97	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 97	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 97	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 98	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 98	50	X	X	Record	O	DS-50	6	S
OUT_UNIT_TEXT	P. 94	51	X	X	Simple	O	Octet String	16	S
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	–	–	–	–	–	–	–

27.6 AI 2 Sound velocity block slot 2

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
AI 2 - Sound Velocity - slot 2									
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 100	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 100	18	X	X	Simple	M	Octet String	32	S
STRATEGY	P. 100	19	X	X	Simple	M	Unsigned16	2	S
ALERT_KEY	P. 100	20	X	X	Simple	M	Unsigned8	1	S
TARGET_MODE	P. 99	21	X	X	Simple	M	Unsigned8	1	S
MODE_BLK	P. 99	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 100	23	X	–	Record	M	DS-42	8	D
BATCH	P. 101	24	X	X	Record	M	DS -67	10	S
not used	–	25	–	–	–	–	–	–	–
OUT	P. 92	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 93	27	X	X	Array	M	Float	8	S
OUT_SCALE	P. 94	28	X	X	Record	M	DS-36	11	S
LIN_TYPE	P. 93	29	X	X	Simple	M	Unsigned8	1	S
CHANNEL	P. 99	30	X	X	Simple	M	Unsigned16	2	S
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 95	32	X	X	Simple	M	Float	4	S
FSAFE_TYPE	P. 93	33	X	X	Simple	O	Unsigned8	1	S
FSAFE_VALUE	P. 93	34	X	X	Simple	O	Float	4	S
ALARM_HYS	P. 96	35	X	X	Simple	M	Float	4	S
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 97	37	X	X	Simple	M	Float	4	S
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 97	39	X	X	Simple	M	Float	4	S
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 97	41	X	X	Simple	M	Float	4	S
not used	–	42	–	–	–	–	–	–	–

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
AI 2 - Sound Velocity - slot 2									
LO_LO_LIM	P. 98	43	X	X	Simple	M	Float	4	S
not used	–	44 - 45	–	–	–	–	–	–	–
HI_HI_ALM	P. 97	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 97	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 97	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 98	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 98	50	X	X	Record	O	DS-50	6	S
OUT_UNIT_TEXT	P. 94	51	X	X	Simple	O	Octet String	16	S
not used	–	52 - 60	–	–	–	–	–	–	–
AI2_TYPE	–	61	X	X	Simple	O	Unsigned16	2	Cst
VIEW_AI2	–	62	X	X	Simple	M	Unsigned16, DS-37, DS-42, DS-33	18	D

27.7 AI 3 Flow velocity block slot 3

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
AI 3 - Flow Velocity - slot 3									
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 100	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 100	18	X	X	Simple	M	Octet String	32	S
STRATEGY	P. 100	19	X	X	Simple	M	Unsigned16	2	S
ALERT_KEY	P. 100	20	X	X	Simple	M	Unsigned8	1	S
TARGET_MODE	P. 99	21	X	X	Simple	M	Unsigned8	1	S
MODE_BLK	P. 99	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 100	23	X	–	Record	M	DS-42	8	D
BATCH	P. 101	24	X	X	Record	M	DS -67	10	S
not used	–	25	–	–	–	–	–	–	–
OUT	P. 92	26	X	–	Record	M	DS-33	5	D
PV_SCALE	P. 93	27	X	X	Array	M	Float	8	S
OUT_SCALE	P. 94	28	X	X	Record	M	DS-36	11	S
LIN_TYPE	P. 93	29	X	X	Simple	M	Unsigned8	1	S
CHANNEL	P. 99	30	X	X	Simple	M	Unsigned16	2	S
not used	–	31	–	–	–	–	–	–	–
PV_FTIME	P. 95	32	X	X	Simple	M	Float	4	S
FSAFE_TYPE	P. 93	33	X	X	Simple	O	Unsigned8	1	S
FSAFE_VALUE	P. 93	34	X	X	Simple	O	Float	4	S
ALARM_HYS	P. 96	35	X	X	Simple	M	Float	4	S
not used	–	36	–	–	–	–	–	–	–
HI_HI_LIM	P. 97	37	X	X	Simple	M	Float	4	S
not used	–	38	–	–	–	–	–	–	–
HI_LIM	P. 97	39	X	X	Simple	M	Float	4	S
not used	–	40	–	–	–	–	–	–	–
LO_LIM	P. 97	41	X	X	Simple	M	Float	4	S

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
AI 3 - Flow Velocity - slot 3									
not used	–	42	–	–	–	–	–	–	–
LO_LO_LIM	P. 98	43	X	X	Simple	M	Float	4	S
not used	–	44 - 45	–	–	–	–	–	–	–
HI_HI_ALM	P. 97	46	X	–	Record	O	DS-39	16	D
HI_ALM	P. 97	47	X	–	Record	O	DS-39	16	D
LO_ALM	P. 97	48	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 98	49	X	–	Record	O	DS-39	16	D
SIMULATE	P. 98	50	X	X	Record	O	DS-50	6	S
OUT_UNIT_TEXT	P. 94	51	X	X	Simple	O	Octet String	16	S
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

27.8 Totalizer 1 block slot 4

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Totalizer 1 Block slot 4									
not used	–	0 - 15	–	–	–	–	–	–	–
BLOCK_OBJECT	–	16	X	–	Record	M	DS-32	20	C
ST_REV	P. 111	17	X	–	Simple	M	Unsigned16	2	N
TAG_DESC	P. 111	18	X	X	Simple	M	Octet String	32	S
STRATEGY	P. 111	19	X	X	Simple	M	Unsigned16	2	S
ALERT_KEY	P. 112	20	X	X	Simple	M	Unsigned8	1	S
TARGET_MODE	P. 110	21	X	X	Simple	M	Unsigned8	1	S
MODE_BLK	P. 110	22	X	–	Record	M	DS-37	3	D
ALARM_SUM	P. 111	23	X	–	Record	M	DS-42	8	D
BATCH	P. 112	24	X	X	Record	M	DS-67	10	S
not used	–	25	–	–	–	–	–	–	–
TOTAL	P. 105	26	X	–	Record	M	DS-33	5	N
UNIT_TOT	P. 106	27	X	X	Simple	M	Unsigned16	2	S
CHANNEL	P. 111	28	X	X	Simple	M	Unsigned16	2	S
SET_TOT	P. 106	29	X	X	Simple	M	Unsigned8	1	N
MODE_TOT	P. 107	30	X	X	Simple	M	Unsigned8	1	N
FAIL_TOT	P. 106	31	X	X	Simple	M	Unsigned8	1	S
PRESET_TOT	P. 106	32	X	X	Simple	M	Float	4	S
ALARM_HYS	P. 108	33	X	X	Simple	M	Float	4	S
HI_HI_LIM	P. 109	34	X	X	Simple	M	Float	4	S
HI_LIM	P. 109	35	X	X	Simple	M	Float	4	S
LO_LIM	P. 109	36	X	X	Simple	M	Float	4	S
LO_LO_LIM	P. 110	37	X	X	Simple	M	Float	4	S
HI_HI_ALM	P. 109	38	X	–	Record	O	DS-39	16	D

Name	E+H Matrix	Index	Read	Write	Object Type	Parameter	Data Type	Byte Size	Storage Class
Totalizer 1 Block slot 4									
HI_ALM	P. 109	39	X	–	Record	O	DS-39	16	D
LO_ALM	P. 109	40	X	–	Record	O	DS-39	16	D
LO_LO_ALM	P. 110	41	X	–	Record	O	DS-39	16	D
not used	–	42 - 51	–	–	–	–	–	–	–
TOT1_TYPE	–	52	X	–	Simple	O	Unsigned16	2	Cst
OVERFLOW	–	53	X	X	Simple	O	Unsigned16	2	N
VIEW_TOT1	–	54	X	–	Record	M	Unsigned16, DS-37, DS-42, DS-33	18	D

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