Version List:
Software and Firmware Changes, TAE

1. NF 550

Version	Datum	Änderung
V xxx	xx.xx.2017	- Release
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2. NF 600/CO

Version	Datum	Änderung
V 1.23	23.12.2015	- Product handover to production - Delivery approval
V 1.26	03.10.2016	- Bug fix: analog input 1 - Bug fix: asymmetric level measurement - Introduced level measurement via ModBus (service) - Introduced overlapping measurement windows for level measurement
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3. NF 650

Version	Datum	Änderung
V 1.26	03.10.2016	- Measurement method/calculation according to Midsection method (EN ISO 6416)
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4. NF 750

Version	Date	Change
V 1.10	1.08.2014	- Product handover to production - Start 0-series
V 1.11	21.10.2014	- Error: Sensor board small control twisted relay - Error: did not draw last v-sensor in 3D image - Error: keyboard not suitable for entering IPs if if decimal point = comma - Error: I-sensor handling was coupled to IXT/MPX as soon as IXT was selected in connections menu. - Error: in combination with I-sensor brief v-sensor errors (indication errors) could occur after reparameterisation - Feature: error message external reading - Feature: locking error message bistable relay - Feature: adjustable display backlight - Feature: display will dim after adjustable period - Feature: trend implemented (day/week/month) - Feature: bootloader update (service level) - Feature: system reset (default settings) - Change: programming file suffix changed to .prog

V 1.12	20.11.2014	- Error: Raw values of level measurements flickering for 30s despite invalid readings
		- Error: Firmware Version field of SKG board was shown at S1/SR
		- Error: Bootloader update could crash
		Error: If i-sensor HART via IXT echo profile display did not work
		- Error: During hcrit-transition upwards 0.0 has been displayed briefly; if unit was turned on under hcrit
		- Feature: h/v-simulation added
		- Feature: maximum intrusion depth in DSP parameter
		- Feature: Option to format USB stick
		- Feature: Adjustment of analog input integrated into simulation menu
		- Feature: Control DO and AO via Modbus slave
		- Feature: Signed data type (+/-) for Modbus introduced
		- Feature: Error value for Modbus introduced
		- Feature: particular unit system for data transfer introduced
		- Feature: Unit of external reading in csv/txt-file
		- Feature: Readings file (csv/txt) with Bytorder-Mark and UTF-8
		- Feature: Total can be set
		- Feature: Negative totals impulses introduced
		- Feature: autom. restart in case of changed communication parameters
		- Feature: Strings in binary structures extended to three times the length
		- Feature: USB stick Kingston DT R3.0 G2 supported
		- Feature: error messages are saved in werden in individual block structure
		- Feature: Direct access to error messages via FTP
		- Feature: Using service level 2 the internal RAM file system can be accessed remotely using the file selection
		- Feature: FTP archive files "all.gz": loads all data
		- Feature: 3D flow profile indicates real channel geometry
		- Feature: 3D flow profile uses all sensor data (asymmetric flow profiles)
		- Feature: new Diag submenü for direct selection of 3D flow profile
		- Change: Default level sensors >pressure only< in start
		- Change: KKF limit value removed from DSP parameters
		- Change: Texts adapted
		- Change: no raw values in gates display without service code
		- Change: USB transfer txt-format as standard
		- Change: sequence of menus twisted
		- Change: USB stick error messaged adapted
		- Change: 1s, 2s and 5s storage cycles now only with service level
		- Change: No. of max. characters of ext. readings units limited to 5
		- Change: Anzeige ext. Messwert im Messdatenfile nur wenn ausgewählt
		- Change: IXT and SKG auto update does not "downgrade"
V 1.14	11.12.2014	- Error: During FTP transfer of archived data sensor communication bytes got lost.
		- Error: Communication error in Modbus-TCP (Select)
		- Error: After erasing archived data programmed DO impulse outputs got stuck.
		- Error: Echo profile indication I-Sensor related to IXT/MPX not yet correct
		- Error: after reparameterisation in conjunction with IXT/ MPX analog outputs could be affected

		- Error: Faulty calculation of gate position in case of horizontal sensor installation - Error: Unit could crash entering numbers with more than 31 decimal places. - Error: I sensor level value did not become invalid with com. error - Error: 2-wire level value did not become invalid falling below/exceeding 4/20 mA - Error: V-values did not become invalid with communication errors - Error: After reparamterisation readings may have become briefly invalid. - Error: Memory leak in archive FTP transfer removed - Error: iXT can be used with other baud rates too - Error: I-sensor parameterisation - Error: decimal places + name of reading can be adjusted in the main screen - Error: Direct access to trends via main screen - Error: Direct access to error messages via Q-context menu - Error: Comparison of sensor properties with parameterisation and error message if available - Error: Service codes can be changed freely - Error: PUK code introduced - Error: rudimentary support for DSP board - Error: Navigation through separators possible (</>) - Error: Separators 4 hrs/1 hr introduced - Change: Accelerated drawing of tiles in main menu - Change: iXT-Bundle V1.10 (allows to set other baud rates) - Change: 2 decimal places for [l] and [l/s] introduced - Change: Sensor query every 2 minutes - Change: Communication errors have immediate effects without considering stability parameters - Change: Min. requirement for System reset service level >8172< - Change: Sensor measuring time 4 sec. - Change: Readings in v-histogram buffer remain valid for 60 sec.
V 1.16	18.02.2015	- Error: Production startup: error on entering the time - Error: Negative offset and level measurement span were locked - Error: I-Sensor: >Measurement window width< missed - Error: MAX11613 ADC on expansion boards is re-initialised cyklically (100 ms) to avoid faulty level measurement via 4-20 mA from ext. transmitter - Error: Level menu: combination NIVUS-LUS and I-Sensor/2-wire were disregarded - Feature: Sensor installation flush with wall in v-menu for pipe, ellipse and egg-profile (entry of angles required only) - Feature: Negative totals will be saved - Feature: Modbus-totals as 64 Bit (in liter) and "double" (in cubic meter) added - Feature: Automatic conversion of older archive structure to new structure (compatibility after updates always guaranteed) - Feature: Programming menu exit after 15 minutes without entry/confirmation without applying parameters which might have been

		changed - Change: Session timeouts (15 min.) for Telnet and FTP added - Change: Menu structure updated, moved various parameters - Change: Day totals switched to virtual totals - Error: Faulty window mode of level measurement during high dynamics - Error: Faulty default mounting position for air-ultrasonic sensors in egg-profiles - Change: All air-ultrasonic sensors are displayed in the channel centre - Feature: Adjustemt options for analog inputs - Feature: In simulation menu DO + AO conditions are indicated
V 1.17	15.07.2015	**Bootloader:** - Error: USB host was not deactivated. - Feature: pressing and holding the lefthand key indicates reset information if available. **Main program:** - Error: words in the on-points and off-points fields of the limit contacts have been switched - Error: egg profile diameter missing in documentation data set - Error: telegram repeat of the i-sensor's Hart protocol was missing - Error: no reset of temperature error message when switching over to Q/h function - Error: FTP server did not release all sockets -> deadlock after 100 accesses - Error: pressure level error status not correctly set -> no invalid level possible if level measurement was parameterised using pressure - Change: documentation data set tidied up regarding air ultrasound - Change: the righthand key (menu) closes the error message window too as of now - Change: currently used v_{crit} value indicated in v_{crit}-auto - Change: text "h start position" changed to "Switchover level" - Change: updates will be logged in Diag - Change: digital outputs simulation menu as dropdown menu - Change: Baud rate for connection IXT/MPX and sensors can be set even without service code - Feature: when saving data in "Expert" mode parameter backups from the selected period are saved additionally - Feature: limit contact function extended to external readings, sludge level and water as well as air temperature - Feature: error mode for digital limit contacts (Hold/On/Off) - Feature: Implementation of linearisation table for external readings - Feature: remote control accepts entries via keypad - Feature: Hart- and Comdiag can be used via Telnet too - Feature: Swedish language added - Feature: Romanian and Hungarian language partly added - Feature: option "Water bed" added to geometry selection - Feature: file selection menu indicates extra information (size, date) - Feature: sludge measurement and sludge level output via float measurement using combi sensor + external level - Feature: extra unit: l/min

		- Feature: system error messages extended by Voltages/Battery/Archive/ Persistent (Battram)
V 1.18	14.08.2015	- Error: System reset has caused infinite loop - Error: gate positions were not corrected according to the mounting angle of the v-sensor, the sensor-dependent piezo offset was not considered - Error: defective indication of day totals, as soon as the unit has been run for an entire day. - Error: a v-sensor communication error due to faulty measurement konfiguration could occur (invalid level and before that sensor error) - Error: error in documentation parameter set - Change: i-Sensor texts adjusted to programming mask - Change: order of file types in USB stick menu reversed (csv-file first, binary file under service level only). - Change: gate positions and gate velocities are set to "invalid" in display and memory as soo as falling below h_{crit}. - Feature: web server CGI interface extended by content-encoding gzip - Feature: if an i-sensor is connected, the current air temperature is queried from there. If I-sensor + AUS the AUS-temperature is preferred - Feature: automatic limitation of v-sensor intrusion depth by considering sensor mounting angle and mounting position as well as channel dimensions.
V 1.20	23.10.2015	- Error: >Mounting direction negative< for sensors was not considered - Error: faulty error management (errors in display were not correctly reset) - Error: mutual influence and interferences during DO simulation with the controller activated simultaneously. - Change: bootloader update executable in service level. - Change: during simulation the level is no longer limited to the application geometry height set. - Change: controller parameter h-quick close removed - Change: controller error torque is not set before the 3rd closing attempt, otherwise the slide valve is operated (raised) freely within an adjustable period - Change: IO-diagnostics summed up in submenu - Change: H-diagnostics and H-parameterisation revised: not assigned but activated measurements are indicated too. - Change: gates will be reordered as soon as the sensor measures from top down - Change: if the keypad is in standard mode (no numeric entry), the numeric characters show >,< as well as >.< as of now. - Feature: after changing to uppercase mode the keypad can be set to Capslock by pressing and holding the Shift key. - Feature: entering a valid IP will automatically set the corresponding subnet mask. - Feature: transparent headline icons over possibly very long measurement place names - Feature: indication of gate positions can be set to >relative to sensor< (diagnostic function) - Feature: shared H-adjustment for all sensors in H-diagnostics menu - Feature: SNTP parameters can be set in time menu. Time synchronisation

		1x/day if deviation smaller than +/- 4 sec. by system time acceleration or deceleration. Otherwise a "sudden jump" will occur. - Feature: Modbus TCP port free adjustable via keypad as of now - Feature: diagnostics DI with extra information parameterised function - Feature: 2 icons are shown in the display for >Block v-measurement< and >Hold measurement< as soon as the signal is available. >H< = >hold<, strikethrough >V< = >Block measurement<. - Feature: Hold icon is shown after reparameterisation during the restart of the measurement.
V 1.22	04.12.2015	- Error: Storage of parameters in the parameter file was partly not sufficiently accurate causing errors with decimal places - Error: If current flow is lower/equal to the v-sensor mounting position the flow velocity was set to invalid (error exists since Version 1.18) - Error: Trigger quality stability was associated to COSP. Due to this saving the trigger quality was likely to fail. - Error: Impoundage limitation with free profiles partly dysfunctional. Using a free profile with closed top caused the measurement to be set to 0 when exceeding the level. - Error: 4-20mA-level used caused error message (incl. error message relay) after restart. - Error: Rare loss of main screen focus while programming - Error: Faulty gate positioning for not vertically upwards programmed sensor installation - Change: v_{krit} is not activate in all gates anymore. Problem occured as soon as value fell below h_{krit}. In such cases all h-gates were set invalid and the calculated velocity froze at all levels (changed since Version 1.18) - Change: Negative sum impulses can be set using extra field >negative<. Existing systems with negative entries continue to run correctly after the update. - Change: OCL now operates in dual mode after start. Reason: improved evaluation at low distances between sensor and water surface. - Change: Choosing sludge level measurement has set v-sensor 1 to float setting automatically. Now sludge measurement can be chosen only if v-sensor 1 was set to float setting previously. - Feature: Modbus RTU: parity and stop bits can be adjusted - Feature: Automatic IP configuration (DHCP) - Feature: Speckle signal analytics for NIVUS service introduced. Highest service level and sensor as of firmware V2.xx required.
V 1.23	10.12.2015	- Error: Offset value for 2-wire level can be set, however is not used (internally set to 0.000 m constantly). Error since V 1.20
V 2.00	09.06.2016	- Error: v_{krit} was set to 0 as soon as the last v-sensor was mathematically supposed to be not immersed anymore. - Error: Analog input 1 not reliable as external (independent) reading - Error: Dynamic measurment window for level measurement asymmetric Error: "Back" key was shown in start menu of language selection after system reset - Error: Not all of the special characters oft he keyboard were displayed correctly but partly as small rectangles - Feature: As of now a second 4-20mA level can be set and used.

		- Feature: Complete measurement can be restarted in service menu without restarting the unit - Feature: The filling level oft he application can be read in via Modbus (use for service or with NF650) - Feature: Introduction of overlapping level measurement ranges plus optional redundancy and plausibility check. (NF7-Servicemode. NF650-Standard) - Feature: Parameter documentation as PDF direct for printout for customers - Feature: Introduction of complete M9 functions featuring up to bis zu 9 v-sensoren up to 3 different programmable measurement spots and introduction of a 4. virtual measurement spot. - Feature: Polish, Brazilian, Portuguese, Czech, Danish, Spanish, Finnish, Italian, Romanian, Russian and Swedish - Feature: Modbus now transmits Q/h/v/T also as floating point. - Feature: Sensor error messages in case of MPX error are now generated faster - Feature: Pressing and holding the keyboard Shift key creates Caps-Lock - Feature: File system supports full Unicode space - Change: Introduction o fand changeover to new operating system version MQX 4.2 - Change: Control function on transition from dry weather situation to control operation modified. As of now controller uses slide runtime – time from position "Closed". - Change: Menu key on RUN screen moved from right to left side. - Change: Extra analog inputs on MPX/IXT now only available for level measurements, not for independent readings.
V 2.01	26.07.2016	- Error: error handling i-Sensor. NF 750 responds immediately if communication error occurs once. Error has been solved before and was reimplemented accidentaly with V2.0. - Error: Infinite loop (start screen freezes at 40%) likely in case of defective plug-in board (X2 – X4). - Error: if analogue output = Modbus -> no zero point adjustment possible - Error: connecting the EBM, since the initial release the air temperature was overwritten by the water temperature and the same water temperature was indicated twice - Error: PC diagnosis was too slow - Error: Total combi measurement place was not reset to 0 after executing "Delete Archive". - Error: Ethernet interface was initialised always using 100MBit/full duplex (OS error), auto negotiation now working - Error: Q simulation showed the wrong number of digital and analogue outputs - Error: counter input fields used to indicate "." as decimal separator. The separators are now set automatically according to the language menu setting. - Feature: Modifying the TCPIP configuration does not require restart any more. - Feature: as of now it is possible to directly enter values (level and velocity)

			in simulation mode.
		-	Change: Floating point values in Modbus are not scaled using data units any more, but uses according SI units now instead.
V 2.02	27.07.2016	-	Error: faulty gate positioning in large pipes and with single-sensor operation (no tracking with variable levels). Error not occurrent with additional i-Sensor, LUS or 2 x v.
		-	Error: Stability was set to >infinite< internally (in V2.01 only and hence stopped on day of release)
V 2.03	11.08.2016	-	Error: Modbus-TCP Sockets were not released reliably, i.e. as soon as the remote station (e.g. Sofrel) new connections cannot be setup some time.
		-	Error: OS error on high optimisation level (Release) solved which could lead to infinite loop on >Read out time stamp<.
		-	Error: portions of the SD card were not reinitialised during system reset (ref. service levels and some conuter readings).
		-	Error: Impossible to >Delete archived data< using the menu.
		-	Error: Improved communication procedures Modbus RTU.
		-	Feature: Resettable day totals added.
		-	Feature: Improved query performance of i-Sensor.
		-	Feature: Day totals are included when saving data.
		-	Feature: >Data depth< setting extended by >Day totals only<.
		-	Feature: USB stick menu saves setting even after system restart.
		-	Change: Priority FTP-Server-Transfer-Task optimised.
		-	Change: Improved stability of v-measurements in multi-sensor plants M9
		-	Change: "Sum" in English changed to "Total".
V 2.04	31.08.2016	-	Error: Falling below minimum valid gates will output incorrect, clearly excessive velocity instead of invalid readings.
		-	Error: Diagnostics shortcut in readings screen referred to "Settings"
		-	Error: In day totals always the total up to this point in time was saved as oldest value ($\rightarrow$ oldest value makes absurdly high totals, the rest is correct)
		-	Feature: energising delay for error relay can be set freely
		-	Feature: setpoint control can be assigned via Modbus too as of now
V 2.06	14.10.2016	-	Error: Modbus TCP did not respond to default address 255
		-	Error: M9 units using 2/3 measurement places did not correctly evaluate the allocation of outputs to measurement places (parameters of all analog outputs can be set in each measurement place).
		-	Error: M9 units using 2/3 measurement places did not correctly evaluate the allocation of digital outputs to measurement places in diagnostic functions.
		-	Error: Lock v-measurement has not been reset after reprogramming the accordig digital input.
		-	Error: If falling below minimum valid gates the display value instead of the 0-value became invalid.
		-	Change: Adjusted h_{min} and h_{max} calculation in the water bed geometry.
		-	Change: I²C changed to previous driver again (communication with extension boards unstable with disturbing ambient conditions/EMV).
		-	Change: Swedish texts amended.
		-	Change: M9 units using 2/3 measurement places: totalising of screen measurement place # 4 can be stopped via the digital input as of now.

		- Change: >CFD< and >Newline< parameters (MCerts relevant) unlocked on customer level and activated per default.
V 2.0x		-

5. OCM Pro CF

Version	Date	Change
V 5.17	23.04.2013	- Flush function did not start, solved - Troubleshooting controller operation: impoundage times and flush times during flush operation were counting as from the start of the valve. Now the times do not run before the end switch has been reached. - Error sensor-related velocity output of 4-20 mA with 2/3 sensors solved. Levels below the installation height have been output as 0mA previously → changed to 4 mA and no more special error message. - No more limitation of negative height offset max. – 0.4 m in case of using external level sensors. Reason: use of i-sensors - POA-V2 error message at h>5m solved - Text modifications in French language - External level with offset and span as from now are calculated as described in the current OCM CF instruction manual. - Day filkes are now saved as zip-files instead of txt-files. A maximum of 50 day files is saved. The first file will be deleted automatically saving the 51st file. - UTC difference entered in filed header if a time server is used - Diag.txt contains name of measurement place in header - Output of gate lenghts in paramet.txt always
V 5.19	22.11.2013	- Added option to shut down the v-sensor power supply in service menu. Condition: exclusive use of the 4-20 mA level input. On-points and off-point adjustable in the level menu. In case of interrupted energy supply error messages from the sensor are suppressed and sensor information (status etc.) is buffered in the transmitter.
V 5.21	30.04.2014	- Damping H and V modified essentially (values jumping below H_krit) - For DLC: day files in GZ-format contain file name YEAR_MON_DAY.TXT instead of Today.txt - For DLC: time server SNTP in cycle.c with logic verification in cycle.c (time synchronisation) - Error in file Q_H_V_T.txt at 5 s storage solved (date jump within every second line) - For DLC: zip files Today.Gz in arch_ext.c directly into file, no buffer - in RUN-menu day totals interval input shortened (indication during programming). - In EXTRA menu date entry uses DOT-separation instead of – separation (indication during programming). - Dots cannot be used during date entry (indication during programming). - ALT-key blocked when entering numbers (indication during programming).

| V 5.30 | 29.06.2015 | - Stability of Zip-algorithm improved (daily files *.gz)
- Error in free H-width characteristic line at H-fixed value (constant level) solved.
- During H-crit calculation a zero division -> error message could occur accidentally, problem solved.
- Output of water temperature instead of AUS air temperature in ModBus protocol, problem solved. |

6. OCM F / FR

Version	Date	Change
V 3.13	20.07.2013	Function 'Flow Controller': - Q-quick close in ,%' of Q-setpoint. - During valve control using external sepoints (AI) the Q-Squick close is permanently adapted to the Q-setpoint. During parameter setting only values 0% or values within 120 – 300% are accepted. - Loading parameters of older firmware versions will set Parameter "Q-quick close" to 0% (quick close deactivated). - The "Control Position" function drives the valve to the control position in dry weather condition. To do so, Q-current shall reach Q-set and - end switch ,OPEN' shall be connected, then parameterised and activated. - The "Quick Close" function if parameterised (Q-quick close, h-quick close) is always active. - Default parameter "P-Factor" changed to 20 % (old 70 %) - Deafult parameter "Cycle Time" changed to 20 s (old 90 s)

7. NFP

Version	Date	Change
V 1.55	06.09.2012	- New gate division using variable lengths (Ver. 1.54) reset to old version (Ver. 1.53) due to parameter incompatibilities.
V 1.56	15.05.2014	- The communication protocol has been improved for operation with POA-V2 pipe sensors. In case of poor hydraulic measurement conditions (longer sensor measurement times) the gate data transmission is adapted using a wait loop in the transmitter.
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8. NivuChannel

Version	Date	Change
V 2.18	10.07.2013	- Extended geometry data to e.g. width of 200m - Integration of Manning-Strickler to calculate Q below the bottom path
V 2.20	27.02.2014	- Temperatures and path lengths adapted Info: new path lengths 1 MHz 10m and 200 KHz 50m
V 2.30	17.06.2015	- Adjustment of multiple DSP control. - Debugging (signal bleed between several channel DSPs)
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9. NivuSonic and CO

Version	Date	Change
V 2.06	25.11.11	- New communication drivers for Backplane V4

10. DSP

Version	Date	Change
V 5.16	03.09.2013	- Read/write flash at half clock speed

11. PCM Pro / PCM 4

Version	Date	Change
V 4.10	27.01.2014	- The new PCM firmware V4.10 supports operation of the CSM with pressure cell (CSM-D) in combination with electronic box Mini. - Flow velocity detection immediately after h_crit with 3 gates min. (prviously 1 gate). - Damping of sensor raw data has been optimised and is used with all storage cycles. - No more limitation of v-measurement with levels above 5 m. - Storage cycles shorter than 1 minute previously caused multiple files to be saved on the memory card. Error solved.
V 4.12	27.10.2014	- h-measurement error with i-sensor solved. - Dry run detection error (v-measurement shutdown under h_crit) solved. - v-measurement error: with the water level rising the new Gates in the running measuring cycle are evaluated witout raw data damping. Error solved. - Error in continuous operation: in case of standing water the latest flow value is indicated and calculated. Error solved. - The default dampind setting has been changed to 12 measurements (previously 18 measurements). - The min. measuring duration in the cycle was changed from 4 to 6 sec. - The max. number of damping steps in the cycle is limited to 6 steps, so the value jump at damping 12 (default setting) is processed in 2 measurement cycles max.
V 4.13	18.12.2014	- Error in shutdown mode solved: With standing water the values regarding velocity, flow and gates were saved as "#-1" instead of zero.
V 4.14	04.08.2015	- Troubleshooting, case of an invalid level event switching was active. - Troubleshooting, the mounting height of the WUS/pressure was properly displayed when also the WUS was enabled. - Differences of WUS measurement between PCM and OCM Pro CF fixed. - Troubleshooting, the switching threshold in the event mode leads to alarm threshold in D2W. - Fixed incorrect calibration of the 2-wire measurement by using the CAL-menu.

12. POA / CS2

Version	Date	Change

V 1.62	11.10.2013	- New KKF-core V4.2. previously partial watchdog reset at KKF calculation
		- Energy tolerance in KKF calculation at only one TB 0.2 instead of 0.5
		- Suppression of fixed targets (subtraction) essentially revised
		- POA-V2: part 0 with new driving for optimisation of velocity in lower part
		- New command COMM_GESCHW_GetMGKennwerte introduced
V 1.66	17.12.2014	- Revised amplifier control for heavily polluted water, high concentration of reflecting particles and small pipelines
		- Option to adjust sensor-integrated pressure measurement cells through special software in NIVUS headquarter.
V 2.04	07.12.2015	- Optimisation: After sensor startup a test scan is executed to determine settings and optimum applification of the application.
		- Optimisation: EBOX in the first section measures using fixed target suppression. This results in improved v-evaluation at low levels and strong turbulences.
		- Optimisation: In combination with NF750 diagnostic functions have been implemented into MU eliminating the use of LabView with NF 750.
		- Error: 180° installation of v-sensor could be used only up to 1.2 m/s
		- Optimisation: To obtain stable readings EBOX measures using partly 400 Hz and 480 Hz instead of using only 400 Hz.
V 2.06	24.05.2016	- Problems with noise measurement occured while combining steel pipe and slide valve. By extending the switchover times ("deadlocks" of ultrasonic signal) the problem could be solved.

13.   OCL

Version	Date	Change
V 2.13	05.08.2010	- Changeover to AMIC FLASH
V 1.59	30.05.2013	- New OCM-L1

14.   KD2 (KDA NEW)

Version	Datum	Änderung
V 4.02	01.10.2014	- Firmware for new KINETIS processor
		- Digital control and read-out of the pressure element

15.   EBM

Version	Date	Change
V 1.65	05.02.2014	- Supports operation of the CSM with pressure cell (CSM-D) with the Electronic box Mini.
		- The temperature measurement has been optimised to reduce measurement times when operating on the PCM.
		- Errors removed:
		- With CSM and air-ultrasonic sensor configured alternately the water or air temperatures have been set to measurement error (--.--) in I/O menu.

V 2.04	07.12.2015	- Optimisation: After sensor startup a test scan is executed to determine settings and optimum appilication of the application. - Optimisation: EBOX in the first section measures using fixed target suppression. This results in improved v-evaluation at low levels and strong turbulences. - Optimisation: In combination with NF750 diagnostic functions have been implemented into MU eliminating the use of LabView with NF 750. - Error: 180° installation of v-sensor could be used only up to 1.2 m/s - Optimisation: To obtain stable readings EBOX measures using partly 400 Hz and 480 Hz instead of using only 400 Hz.

16. NivuMaster

Version	Date	Change
V 7.3.6	04.11.2013	- Internal Pulsar adjustments for the transmitter „FlowCert" - Amendments for adapted P-series hardware (improved noise floor)
V 7.4.1	04.04.2015	- Slower indication of info texts for menu selection, improved indication of hotkey functions - Bugfixes on digital inputs: - Running-up of internal counters - Pumps are shut down corretly as soon as the max. number of attempts is reached - Due to the elimination of a digital input the LED is maintained red - When selecting pump control parameter 816 is set to 0
V 7.4.3	06.11.2015	- Changes NivuMaster Plus: - When terminating the simulation mode all pump error messages are reset correctly - Input delay time improved - The pumps are blocked correctly after the max. number of startup attempts - New function "Float switch Backup" - Message if a digital input is programmed twice - All NivuMaster versions: translation adjustments and amendments - Modbus-Poll adjustments with pump run times - Venturi dimensions (P719) can be entered directly or as area - New function for NivuMaster 5 relays: "Service-Alarm"
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17. i-Series

Version	Date	Change
V 5.0	19.11.2012	- Sensor update options improved
V 6.0	06.07.2014	- HART commands 13, 17, 18, 20, 42, 35 adapted for communication with NivuFlow. - P930 adjusted (previously equal to P88) - i-15 measurement span (14.5 m) adapted

18. NivuSoft

Version	Date	Change
2.2.1847.0	23.10.2013	- Error overflow volume calculation on V-weir solved.
2.2.2367.0	26.03.2015	- Data import Nivulevel 150 implemented

19. OFR

Version	Date	Change
V1.12	09.12.2013	- First version of sensor firmware from manufacturer
V1.00	01.04.2014	- First firmware version for OCP transmitter (firmware extension)
V 1.04	05.11.2015	- Error in calculation COSP Radar solved. Improved measurement stability