

# CPU Release

## Notes Firmware

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# 4v7r9554 (from 4v7r9547) 01-Aug-2024

## New Features/Mods:

- Web
  - Show block checksums in lowercase (to match certificates, etc)

## Fixes:

- None

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# 4v7r9547 (from 4v7r9455) 23-Jul-2024

## New Features/Mods:

- None

## Fixes:

- General
  - Fix constants checksum so it remains more consistent
- Comms
  - Fix bug when handling raw report data request in xmlcomms

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# 4v7r9455 (from 4v7r9416) 11-Apr-2024

## New Features/Mods:

- Comms
  - If the I/O Board comms fails, reboot once and if it happens again, flag an error/alarm instead of rebooting. This stops a endless loop.
  - If no valid gateway is found for Ethernet Interface 1 (ETH1), default to "0.0.0.0"
- Web
  - Show OPCUA comms connections on the Network page

## Fixes:

- General
  - Fix regression from 4v7r9214-R on the local panel display code
  - Fix regression from 4v7r9214-R on the PNG image code

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# 4v7r9416 (from 4v7r9311) 07-Feb-2024

## New Features/Mods:

- General
  - Lock database when accessing FRAM (to eliminate any race conditions)
  - Add support for Significant Figures
- Comms
  - MQTT
    - Added TLS Support
    - Added URL support for MQTT Broker
    - Revise design to allow Publish and Subscribe to be defined and used in a single task.
- Web
  - Changing NMI switch setting now refreshes web pages

## Fixes:

- Web
  - Correctly check "read access" setting when processing "appstatus" pins
- General
  - Replace use of deprecated system call
  - Fix various Linux build errors
  - Fix integrated lid display regression from r9213

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# 4v7r9311 (from 4v7r9239) 23-Nov-2023

## New Features/Mods:

- Comms
  - Speed up XML request/reply timings (eg for ProveIt comms)
  - Update OPC-UA version to v1.3.7
- Add support for downloading reports in TSV format
- Account for timezone offset when generating SSL certificates
- Enhance broadcast <ALARMSTATUS> with extra data

## Fixes:

- Web
  - Fix URL redirect behaviour
- Comms
  - Fix Truproof comms
- General
  - Fix RS485/422 RTS/CTS handling (requires v5.7.7+ kernel)

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# 4v7r9239 (from 4v7r9214) 23-May-2023

## New Features/Mods:

- Comms
  - OPC-UA: Disable server if the IP Port is set to 0 (zero)

## Fixes:

- Web
  - Rework ajax requests to better handle dynamic screen refreshing
  - Fix modal dialogs no longer pre-selecting "current value" (regression from r9025)
  - Fix current value not updating on "Toggle DigOut" modal dialog
- Comms
  - xlink: Make sure the Array Index is correctly honoured when transferring text data

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# 4v7r9214 (from 4v7r9168) 3-Apr-2023

## New Features/Mods:

- General
  - Add support for Report images (viewing & printing)
  - Skip blank lines when generating Postscript
- Web
  - Report placement divs now use transparent background to match VCCure ReportEditor, PDF and Postscript
- Comms
  - OPC-UA: Set client limit to 20

## Fixes:

- Web
  - Fix browser back button causing "resubmit post data" messages when login page revisited

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# 4v7r9168 (from 4v7r9036) 6-Feb-2023

## New Features/Mods

- Web
  - Add Right Hand Side banner support in header (appstatus2)
- Comms
  - mastercomms: Add support for "single poll" messages

## Fixes

- General
  - Fix issue where SysFlags didn't always update correctly
- Web
  - Ensure menu (in)active status is checked when getting menu hash
  - When list/header hash changes, ignore all other reply values (as they may now be invalid)

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# 4v7r9036 (from 4v7r8979) 26-Oct-2022

## New Features/Mods

- General
  - Add DST settings to Constants Log
  - Prefix "NTP" settings on Constants Log
  - Add Number Format settings to Constants Log
  - Load/save "Number Format" to System settings from SETUPS
- Web
  - Add 'p' style option to denote item is a password (and only show '\*\*\*\*\*')
- Comms
  - Add OPC-UA Client support
  - Add configurable IPPort to OPC-UA server
  - Add support for multiple XMLLink instances

## Fixes

- General
  - Fix handling of stand-alone "scope" blocks "{...}"
- Web
  - Fix line spacing to prevent descender clipping
  - Empty/Blank items now show default panel background (unless 'bg=xxxxx' specified)
  - Fix modal edit box handling
- Comms
  - Fix OPC-UA login handling
  - Fix OPC-UA open62541 socket leak (commit 70db6ac4e97254b468cd7a7ba7ac8998874e815a)

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# 4v7r8979 (from 4v7r8933) 21-Jun-2022

## New Features/Mods

- General
  - Cater for apps where not all ADC pins are defined in the target file
  - Add hooks to load/save System settings from SETUPs
- Comms
  - Rework OPC-UA to support ControlWeb

## Fixes

- Web
  - In Constants Log, active menus now shown as "inactive" if parent is inactive
- Comms
  - Add missing event log entries (eg Task Failed) on xmlcomms
  - Strip pipes from table entries on OPC-UA link
  - Increase sanity checks in read/write functions to prevent possible xmlcomms crash

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# 4v7r8933 (from 4v7r8877) 12-Apr-2022

## New Features/Mods

- Comms
  - Add support for "ControlWeb" style string-only tagnames and lists in OPC-UA

## Fixes

- General
    - Fix broken 'continue' in if() statements
    - Fix ConvertNumberFormat() to handle exponents correctly
  - Web
    - Fix column wrapping issue
    - Rework postscript scaling
    - Fix javascript issue with pins containing apostrophes in the pin name
-

# 4v7r8877 (from 4v7r8871) 21-Mar-2022

## New Features/Mods

- Web
  - Remove need for "index.html"

## Fixes

- Web
    - Allow user names to be changed to the same but with different letter cases (e.g. "Bob" to "bob")
    - Fix issue with pin array dimensions not being set correctly
-

# 4v7r8871 (from 4v7r8787) 14-Mar-2022

## New Features/Mods

- General
  - Implement prover timing/count roll-over handling to extend maximum prove length
- Web
  - Vertical centre no longer scales font size by 150%
  - On the local panel mimic, prevent clashing panels (we now only use the first active panel in any particular position)
- Comms
  - Add "ShowPinId" attribute to xmlcomms <TagNames> request
  - Added "Type" to the <Live\_Data> xmlcomms request to enable getting only "writeable" pins

## Fixes

- General
  - Fix possible crash when report placement is beyond end of background text
  - Fix missing report placement formatting
  - Prevent possible crash when loading alarms
  - Move printer 1 serial port checking into thread to prevent crashes
  - Fix issue with pin array dimensions not being set correctly
- Web
  - Fix incorrect initial ADPs when creating live web reports
  - Live reports now correctly update when placements change active state
  - Don't encode HTML entities when downloading TEXT or TSV files
- Comms
  - Fix hang when doing large numbers of writes by OPC-UA

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# 4v7r8787 (from 4v7r8770) 19-Jan-2022

## New Features/Mods

- No Changes

## Fixes

- Web
  - Fix possible crash when creating TSV reports
  - Fix dropdown menus in Internet Explorer
  - Prevent possible crash when changing printer typeno changes

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# 4v7r8770 (from 4v7r8674) 17-Dec-2021

## New Features/Mods:

- General
  - Add "Task Fail" event
  - Add isnan() and isinf() functions
  - Rework print spool handling so each printer has its own thread
- Web
  - Add "Delete Certificate" item to Network page
- Comms
  - Add possibility to see if a comms link is "disabled" rather than in error

## Fixes:

- General
  - Harden the IO firmware extract/install process
  - Fix handling of formatting codes (bold, underline, etc) when generating reports
- Comms
  - OPC-UA: Bug fixes
  - Harden serial port driving for slower links

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# 4v7r8674 (from 4v7r8665) 1-Oct-2021

## New Features/Mods:

- General
  - Sanity check ADC/PRT field calibration data on startup ... if zeros, reset to defaults
- Web
  - Add 'v' style option to vertically centre (and left align) a title, value or unit [to make (eg) a custom separator item]

## Fixes:

- Web
  - Fix report placement "left align" formatting truncating data

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# 4v7r8665 (from 4v7r8310)

## New Features/Mods:

- General
  - Support "LEDs" or "Leds" output pin
  - If FRAM processing fails on startup, indicate an FRAM restart (not a coldstart)
  - Remove file size limit when downloading from SD Card
  - Add support for "continue" statement in for() and while() loops
  - Add log10() and ln() functions
  - Add fmin() and fmax() functions
  - Add pi() function
  - Add International support for thousands and decimal separators (comma, point and (thousands) space)
  - Ignore TCPLogger messages when no log viewer connected
  - Add STRING datamap datatype
  - TCPLogger, show task name \*and\* comms name (where applicable)
  - ZeroConf broadcast now informs when new app or firmware installing
  - Add support for PWM mode on PulseOut
- Web
  - Add PDF format to the "Download As ..." options
  - Allow Constants Log to be downloaded as a TSV file
  - Fix HTML warnings (SameSite cookie and CSS zoom)
  - Add support for additional Gen3 RAWOUT modes
  - Add support for 'printing' Constants Log and Sitemap to FTP
  - Add support for 'printing' Alarm/Event logs to FTP
  - Add "metrology blocks checksum" to web System Info page and Constants Log
- Local Panel
  - Add lid chart support
  - Add support for "Lid" display tree
- Comms

- Skip "system screen" pin map entries in XML <Live\_Data> request
- Add OPC UA comms task
- Add MQTT comms task
- Increase security timeout to 30 seconds (to cater for slower network links)
- Reduce minimum inter-message delay (to allow for faster polling)
- Add better support for ASCII strings via (eg) Modbus
- FTP
  - no changes

## Fixes:

- General
  - Enhance trap when expansion card not fitted
  - Better support for loading apps with multiple <SETUPS>
  - Fix "Download as ..." typo
  - Improve number handling & fix buffer overflow when archiving historical data
  - Fix parse issue when operator missing RHS before bracket, e.g. foo = (1 \* );
  - Fix login issue
  - Fix possible lost FRAM fail flag on startup
  - Add range checking on PWM rate and Pulse Output bucket
  - Make sure display pins in "METROLOGY" group are included in metrology checksum
  - Fix > 100% progress when updating app or Altera
  - Make sure rdserver attaches to TCPLogger correctly
  - Strip full path from pin name when loading TAGNAMES datamap
  - Fix "read-only" pin checking
  - Add missing FTP events
  - Fix FRAM SysInfo version checking
  - Fix string width limit check
  - Correctly initialise FRAM if invalid
  - Ensure TCPLogger closes sockets correctly when link is closed
  - Ensure message queues are closed correctly

- Fix alarm state strings
- Web
  - Fix web threads picking up incorrect information
  - Fix incorrect pipe (|) handling when downloading text events/reports
  - Fix position of spinning "loader"
  - Fix ADC calibration screen
  - Fix SD Card "download" icons
  - Improve number handling when downloading historical data
  - Fix possible incorrect DST status
  - Fix 'Edit User' dialog unable to change security level
  - Fix "Digital Outputs" dialog
  - Fix back-to-front SDCard Install/Remove option (broke in r8235)
  - Fix missing TFX upload format option
  - Fix "undefined" text in "Network Rebooting" window
- Local Panel
  - no changes
- Comms
  - Fix handling of comms links using ASCII string messages
  - Fix "bytes per address" handling in Modbus Modicon mode
  - Trap unused system screens in <Displays> request in XMLComms

# 4v7r8310 (from 4v7r7956)

## New Features/Mods:

- General
  - Add SYSINFO2 pin to template
  - Return CPU revision at end of OS Version string
  - Detect board types on startup
  - Mods to add support for new Rev3 boards
  - Check for SysTemp input
  - Implement combined "metrology blocks" checksum
  - Add "metrology blocks checksum" to web System Info page and Constants Log
  - Add initial code for comms link to MTI encoder
  - Change various "version" strings to "firmware"
  - various small enhancements
- Web
  - Disallow Metrology pin edits if Metrology bitlink not set
- Local Panel
  - Add support for lid display
  - Comms tx/rx data now sent to TCPLogger
- XML
  - Honour "METROLOGY" group setting
  - OPC XML now splits top level browse into "#Displays" and "#Tagnames"
  - Add "Metrology" support for OPC XML
  - OPC XML now returns date/time and IP addresses as strings
  - Add "sync" command to <Time\_Sync> request
  - Return OPC error E\_ACCESS\_DENIED when Metrology pin check fails

## Fixes:

- General
  - Fix offset lookups when scanning arrays
  - Fix displays tree scanning of nested menus
  - Calculate app hash using the same method as VCCure
  - Fix scanning for system screens
  - Fix checking for "read-only" datamap pins
  - Fix array length/dimension scan
  - Fix string extraction from report data
  - Correctly set flags on namemap entries
  - Fix "missing items" when scanning displays tree
  - Fix NTP time handling (timezone offsets and correct epochs)
  - Fix missing TSV header line when downloading historicals (before you've viewed a chart)
  - Remove pipe characters from units when viewing/downloading historicals
  - Check SDCard inserted before saving network debug info
  - Ensure un-initialised variables default to zero
  - Add legacy support for apps with no "SERIAL\_BAUD\_RATES" table
- Web
  - Fix 'maxlength' values for usernames (max 16 chars) and passwords (increase to 32 chars)
- XML
  - Fix OPC <Browse> of TAGNAMES of array pins
  - Fix bug when reading arrays
  - OPC XML "#Tagnames" browse now honours filter
  - Prevent writes to "read-only" pins
  - Ensure TAGNAMES pins are added to the namemap
  - Fix OPC string array indexing bug
  - Don't hide pins whose name starts with a '!'
  - Fix NTP "active value" table (only showed last entry not all but first!!)

- Various minor bugfixes

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# 4v7r7956 (from 4v7r7787)

## New Features/Mods:

- General
  - Add support for new Modbus link template format
  - Add support for "SysControl" output pin
  - Add ACCEPTALARMS on bit 0 of SysControl pin
  - Improvements to syntax, incomplete expression and unary operator parsing
- Web
  - Added "Metrology Checksum" to System Info page
  - Hide TFX FTP options if app has no TFX reports
  - Updated Printer1 Baud Rate to use SERIAL\_BAUD\_RATES table
- Local Panel
  - no changes
- XML
  - Report "ident" now returned in <Report\_Index> request
- FTP
  - no changes

## Fixes:

- General
  - general bug fixes
  - Alarm "live" value now correctly updated
  - Report previews and print-outs now show missing placement formatting correctly
  - Fix broken scanning for pins in TOTALS group
  - Only run FRAM check if data was actually written that cycle (fixes false "FRAM FAIL" alarms)
-



- Web
  - Honour custom font sizes on menu items
  - Chart series names now generated dynamically (as dynamic units might change)
  - Change to using shared memory network data (fixes issue with multi-threaded web tasks)
  - Fix empty file when downloading snapshot report
  - Fix empty "last 30 reports" zip file
- Local Panel
  - no changes
- XML
  - no changes

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# 4v7r7787 (from 4v7r7781)

## New Features/Mods:

- General
  - no changes
- Web
  - no changes
- Local Panel
  - no changes
- XML
  - no changes
- FTP
  - no changes

## Fixes:

- General
  - no changes
- Web
  - Fix web banner handling
- Local Panel
  - no changes
- XML
  - no changes

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# 4v7r7781 (from 4v7r7768)

## New Features/Mods:

- General
  - update restart mechanism when commended via the web browser – now shuts down in a more controlled manner.
- Web
  - no changes
- Local Panel
  - no changes
- XML
  - no changes
- FTP
  - no changes

## Fixes:

- General
  - no changes
- Web
  - Make sure all tabs logout when logout occurs on any tab
  - Don't add links to ALARM or TIME/DATE screens when at login page
  - Fix web banner updating
- Local Panel
  - no changes
- XML
  - no changes

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## 4v7r7768 (from 4v7r7739)

### New Features/Mods:

- General
  - no changes
- Web
  - Banner allow use of title, value, unit attributes
- Local Panel
  - no changes
- XML
  - no changes
- FTP
  - no changes

### Fixes:

- General
    - Fix time handling to work past 2038
    - Fix NTP sync on startup
  - Web
    - Minor fixes
    - Reboot in an orderly manner when requested via the web server
  - Local Panel
    - no changes
  - XML
    - Fix bug in <Live\_Data> request
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## 4v7r7739 (from 4v7r7621)

### New Features/Mods:

- General
  - no changes
- Web
  - no changes
- Local Panel
  - no changes
- XML
  - Add <TABLE> attribute to read-only display pins
  - <Identify> request now returns pinids you can use with <Live\_Data> request
- FTP
  - no changes

### Fixes:

- General
    - Minor layout fix when using formatting attributes
  - Web
    - Minor fixes
    - Reports now hidden from "Report Routing" when report set as not visible
    - Reports now hidden from "Sitemap" when report set as not visible
  - Local Panel
    - no changes
  - XML
    - no changes
- =====

# 4r7621 (from 4v6r6-6970)

## New Features/Mods:

- General
  - TCP Logging feature added
  - Changed "Application Setup" to "Dataset" to match other descriptions
  - Added support for "clog" attribute to show/hide inactive constants log items
  - Add support for hardware temperature sensor
  - Add 128K/512K FRAM size detection
  - Check FRAM size on app install
  - SD Card now supports: EXT4/3/2, FAT32, FAT
  - Various Comms improvements
  - Reset Real Time Clock to epoch when doing FAILSAFE restart
  - Use 2018 as Real Time Clock reset year.
  - Move to new firmware version format (e.g. 4v7r7515-R, B or A, where R=Release, B=Beta, A=Alpha)
  - Add Licence check function nflcisvalid()
  - Add support for ASCIIx2, ASCIIx4, ASICIx8 formats to assist with interfacing to other modbus text protocols.
  - Add RAM based Historical Zone
  - Add Constants Log checksum for all keypad constants (not just Metrology constants)
  - Add support for "file='???' " report attribute
  - Allow qrcode reports to be printed to Postscript printers
  - Add support for "FTPFORMATS" table
  - Add support for "print only" reports
  - Rework pipe -> newline handling
  - Add support for report custom font size (use "fs=?" in report attribute)
  - Update Postscript glyphname for Unicode 03BC (mu)
  - Each "printer" now has its own spool (avoids lost jobs if another printer gets stuck)
  - Add SD Card "write protect" detection

- Add FTP info to Constants Log
- Add alarm "live" value to alarm state
- Set "RTC Error" flag (SysAlarms bit 15) if Real Time Clock is invalid on startup
- Add app Alarm Status to top two bits of SysAlarms pin
- Add NTP "sync on startup" option
- Reset FTP settings on FAILSAFE restart
- Web
  - Add support for table sorting (normal, reverse, A-Z, Z-A)
  - Add "Software Checksums" to System Info screen
  - Remove DigOut edit from "manual" System Info page
  - Remove 60sec auto-update from trending charts
  - SD Card "install" option now only shows Install or Remove (depending on current status)
  - Add auto-shrink to breadcrumb trail
  - Added report download options (eg Text, TSV, TFX)
  - Support background/foreground colours on menu items
  - Add destination printer name when showing spool files
  - Change DST status from "(not) in effect" to just "enabled / disabled"
  - Add FTP "Send Test File" option
  - Print spool reworked (expand/collapse per printer)
  - Add support for "date" pins on the display trees
- Local Panel
  - Add support for TCP connection
  - Add support for "Alarms" page
  - Add support for "local panel version" ... passed into SysInfo[] array if present
  - Add "style" attribute to Live Report item xml
- XML
  - Add support for Master/Slave XML link
  - <Report\_Index> now shows any report attributes
  - Add missing "Report Routing" from default system setup screen

- Add missing "Analog Inputs" from default system setup screen
- Add support for "Show Digital I/O" system screen
- <Alarms> request: replace "Set" and "Accepted" tags with "State"
- Add language support
- FTP
  - "%" formatting codes can be used in FTP upload directory

## Fixes:

- General
  - Fix various comms issues
  - Prevent database writes on slave comms being stored in the Operator Event Log
  - Make sure we check for "SERIAL\_PORTS" and/or "SERIALPORTS" tables
  - Fix placement leading zeros / left-align handling
  - soft functions supported in variable declaration, e.g. `int x = myfunc();`
  - soft functions supported in existing variable non-equals equal types, e.g. `x += myfunc();`
  - 'else' within 'for' loops issue fixed
  - Make sure we "always run" when processing iterative containers
  - Fix initialisation of volatile database pins
  - Fix incorrect time offset
  - Ignore print to SD Card if not inserted or read-only
  - Fix reply message byte count checking
  - Flush comms buffer before sending new poll
  - Fix incorrect network port indexing
  - Ensure we don't save files to SD Card when it's not mounted
  - Remove SDCARD and FTP from "All Printers" alarm flags
  - Fix report placement bold/underline (download and print)
  - Fix ADP handling
  - Fix "System Screen" detection
  - Ensure table items starting with a "!" are hidden



- Web
  - Fix missing NTP sync mode "startup & daily"
  - Catch when trying to display non-existent live report
  - Fix "Unknown" spool type for Historical and Alarm/Event archives
  - Fix report placement bold/underline
  - Fix Edit box "Accept" button grey starts for numbers/dates/etc
  - Fix web printing indexing bug
- Local Panel
  - Fix possible incorrect "display active" flag on start-up
  - Fix memory leak
  - Fix report preview xml
  - Fix qrcode xml
- XML
  - Fix default ADC slot in <ADC\_Calibrate> request
  - Fix missing NTP sync mode "startup & daily"
  - Fix memory leak
  - Fix bug when sending <Notify> packet to server

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## 4v6r6-6970 (from 4v5)

### New Features/Mods:

- General
  - Add support to be able to update OS via firmware update.
  - Add support for multiple tar files per zip file.
  - Web calendar now shows "creating archive" box when downloading zipped reports.
  - Add support for Report/Live Screens "Visible" pins.
  - Improve support for modbus formats in comms.
  - Allow qrcode reports to be printed to Postscript printers
  - Add "force visible" tag for TFX report items
  - Add FTP info to Constants Log
  - Add SDCard and FTP error flags
- Web
  - Re-instate "Show Last 30 Reports" now we're using calendar view.
  - When no web printer routing set, hide the printer icon.
  - Add support for "appstatus" pin. This allows custom messages/status to be shown in the header section of the web displays (where the Device ID, Alarm Indicator and Time/Date are shown).
  - Add support for "FTP Upload".
  - Remove 60sec auto-update from trending charts
- XML
  - Added following requests;
    - <Alarm\_Log\_Index>
    - <Event\_Log\_Index>
    - <Report\_Routing>
    - <Constants\_Log>
    - <ADC\_Calibrate>
  - Only allow admin/metrology logins.
  - Add FTP support to <Report\_Routing> request.

- Add FTP support to <Printers> request.
- FTP
  - Add support to push reports in TFX format (with fallback to Text or TSV)

## Fixes:

- General
  - Fix TFX "real" to "alpha" conversion.
  - Rework spool filenames to prevent filename re-use (and hence lost print jobs).
  - Handle issue when LanguageInUse <= 0 on local panel.
  - Fix bug on local panel mimic not showing "value + units" style.
  - Fix post-boot network check so it rescans network settings before checking validity.
  - Increase post-boot network check to 30 seconds.
  - Allow Slave Comms to close gracefully when signalled.
  - Ensure printer routing setup correctly on coldstart.
  - Ensure database updated on comms timeout.
  - Improve support for Table lookups.
  - Various Time/Date handling improvements.
  - Fix display of "default" system screens.
  - Add missing ALVs on DST change-over events.
  - Allow entry of empty strings, where applicable.
  - Fix missing edit name if changing Languages pinid.
  - Various smaller bug fixes.
  - Fix incorrect TFX epoch.
  - Fixed Network Port Indexing.
  - Fixed Web Printing Indexing.
  - Fix Modbus Master/Slave
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- Web
  - Fix menu "read access" checking.
  - Fix sitemap "active item" checking.
  - Fix table popup for reset-to-n pins.
  - Don't show "invalid" event info.
  - Fix "site icon" favicon.
  - Fix missing "delete" icon in printer spool.
  - Web calendar improvements to prevent lost report items.
  - Fix system menu column spanning.
  - Add CSS to support "centered button-only" items.
  - Fix incorrect parsing of cookies.
  - Fix HTML when display tree empty.
  - Limit max # columns on web displays.
  - Reposition and resize edit 'gear' icon to top-right of each entry.
  - Various CSS tweaks.
- XML
  - Remove/fix redundant code.
  - Check NMI link for metrology pins.
  - Ensure logged events always have a username.
- Licensing
  - Fix issues when changing license type.
  - Correctly initialise license info.

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