



TESLA 4000

Firmware v2.4a

Release Description

DATE: 2025-07-18

FEATURE ENHANCEMENTS

- Cyber Security:
 - None.
- General:
 - Added support for NERC PRC-028 with EX storage option, this will increase the CDR retention period to more than 20 days with maximum channel and sample rate configuration.

CORRECTIONS TO ISSUES

- Cyber Security
 - None.
- General
 - None.

COMPATIBILITY

TESLA Control Panel Software	V4.2 and above
RecordGraph Software	V6.3 and above
ERL 61850 Configurator	V4.1 Rev0 and above
RecordBase Central Station Software	V5.7 and above
Record Base View Software	V5.7 and above
ICD File Version	v3.1 Rev 02
Setting Version	410
TESLA 4000 User Manual	v3.6 Rev 1
4000 Network Redundancy Module (PRP & RSTP) Firmware	v1.0
4000 Network Redundancy Module (HSR & RSTP) Firmware	v1.0
Security Notification System User Guide	v1.0 Rev 0

Minor releases, designated with a revision or letter (e.g. v3.4 Rev 1 or v3.4a), maintain the same compatibility as their base version (e.g. v3.4 Rev 0 or v3.4).

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REVISION HISTORY

v2.4 – 2025-04-04

- Enhancements - General:
 - Added support for Group Record Trigger mode. This feature allows cross-trigger and records combine from up to 8 units which can be mixed between TESLA 4000 and TESLA 4000-A recorders.
 - Enhanced chatter detection feature to include analog trigger chatter detection and user configurable chatter threshold.
 - Enhanced storage alarm to include storage retention days as an additional alarm trigger condition.
 - Enhanced CDR recording to include DC inputs.
- Cyber Security
 - Updated default rbc's user's role to support event collection.
- General
 - Major: Fixed issue where CDR data may occasionally get corrupted after setting load with CDR related setting change.
 - Major: Fixed issue where low speed and CDR recording may show wrong calculation for the calculated channels when the associated current input level is very low.
 - Minor: Fixed issue where the current input angle goes to zero when its magnitude is less than 5% of nominal on a 1A nominal CT.
 - Minor: Fixed issue where user defined channel name length may exceed firmware allowed name length and causes error in the diagnostic log.
 - Minor: Fixed issue where adding new DNP3 master station in the DNP3 configuration causes unit soft reboot.
 - Minor: Fixed issue where time screen still indicates SNTP sync even without a valid SNTP server address.

v2.3a – 2022-07-08

- General:
 - Added support for minor changes to the Main Processor Board hardware to address supply chain issues. This change has no impact on the functionality of the TESLA 4000 when compared to the v2.3 Firmware release.

v2.3 – 2021-12-17

- Enhancement: Added support for new input module type 401013-2 40x 5A Split Core.
- Enhancement: Added support for new input module type 401027 AC/DC Input Module.

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- Enhancement: Added support for new input module type 401028 600V PT Module.
- Major: Fixed issue where secondary current and voltage above 164A/164V was clipped in swing and CDR recordings.
- Minor: Fixed issue where the last digit of the Network Redundancy Module MAC address was not shown in the TESLA Control Panel Network Redundancy screen.
- Minor: Fixed issue where all undefined fault locators were reported in the event log when analog channel 1 reported a high magnitude trigger.

v2.2 – 2019-02-15

- Enhancement (Cyber Security): Changed the default security profile to not require a password change upon initial login.
- Enhancement: Changed the default Incoming “IRIG Time Signal Properties” setting to Auto instead of Manual. This setting is on the Time screen in TESLA Control Panel.
- Enhancement: Improved fault location accuracy. Setting changes are required. Refer to section 9.15 of the TESLA 4000 User Manual for more information.
- Minor: Fixed issue where the year reported was sometimes incorrect when using IRIG-B timecodes that do not contain year information (B000, B0001, B002 and B0003) with the time source configured for local time.

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v2.1 – 2019-02-15

- Enhancements - Cyber Security:
 - Added support for allowing TESLA Control Panel, RecordBase Central Station, and FTP to connect to the IED using configurable TCP (Transmission Control Protocol) port numbers.
 - Added cyber security event logging to an external syslog server. Syslog server message protocol is compliant with RFC 5424 and RFC 5426.
 - Modified the default user accounts, “view”, “change” and “service”, to align more closely with legacy user accounts.
 - Added new Role “RBCS” and modified the default “rbcS” user account to simplify user account setup for IEDs that are to be used with RBCS.
 - Added new user account “rcdreader” to the default user accounts to simplify user account configuration for IEDs that are to be used with third-party software for record collection.
- Enhancements - General:
 - Enhanced Daylight Saving Time configuration and reporting capabilities.
 - Added support for enhanced capabilities of THD and Harmonics settings.
 - Enhanced IED health monitoring capabilities to detect and automatically recover when the IED isn’t behaving as expected.
 - Improved error handling mechanisms that allow for better diagnostic information to be provided to users when there is a problem detected within a coop group.
 - Moved the SCADA (DNP3/MODBUS) communication configuration settings from the setting file to TESLA Control Panel Communication configuration screens for consistency with other IED communication configuration settings.
 - Modified the Ethernet Maximum Transmission Unit (MTU) size for IEDs with the redundancy option. This keeps the frame size below the Ethernet jumbo frame limit, allowing connection as a Single Attached Node (SAN) in PRP mode.
- Major: Corrected issue where the start time of requested CDR records was slightly earlier than requested.
- Minor: Corrected issue on Frequency monitoring channels where the input channel’s minimum magnitude threshold was incorrect if using a DC module.
- Minor: Corrected issue where CDR data accumulation may stop if the IED is repeatedly manually rebooted.
- Minor: Corrected issue where the Ethernet configuration could not be saved unless a Gateway address was assigned.
- Minor: Corrected issue introduced in v2.0 where the scaling factor was incorrectly applied to ROCOF (Rate of Change of Frequency) for PMU when the integer format was selected.

v2.0 – 2018-04-13

- Enhancement: Added Role Based Access Control (RBAC) for enhanced access management. Support is provided for up to 32 users.
- Enhancement: Added configurable password complexity and change frequency rules.
- Enhancement: Added configurable user account validity periods.

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- Enhancement: Added automatic disconnection from an IED if no activity detected for a programmable period of time.
- Enhancement: Added audit trail for security events monitoring.
- Enhancement: Modified FTP server to restrict access to specific folders according to assigned roles.
- Enhancement: Disabled all unused open TCP ports.
- Enhancement: Added resource locking of critical resources (settings, configurations, etc.) to prevent multiple users from overwriting the each other's changes.
- Enhancement: Added support for IEEE C37.118.1-2011 (amended by IEEE C37.118.1a-2014) including the addition of P and M class filters.
- Enhancement: Added support for IEEE C37.118.2:2011.
- Enhancement: Increased the number of PMU Analog channels to 24.
- Enhancement: Added frequency and THD support in PMU Analog.
- Enhancement: Moved all maintenance features previously available via terminal port access (Telnet) to TESLA Control Panel with access from any communications port.
- Enhancement: Added support for remote firmware update.
- Enhancement: Increased the number of supported frequency triggers to 12.
- Enhancement: Added support for an enhanced Time screen and settings to add auto and manual modes with more flexibility in connecting to different IRIG time modes. Added support for B000 and B001 modes.
- Enhancement: Added support for adding a Force Hardware Reset button to the Identification screen.
- Major: Fixed issue with receiving time when connected to IRIG sources generating modes without year information (B002, B003).
- Major: Forced each PMU dataframe to be sent as a separate message instead of packing multiple dataframes into a single message.
- Major: Fixed issue where the delay of a logic function is greater than the setting when it depends on the output of a 2nd logic function.
- Minor: Fixed issue where a PMU configuration change is not reported to the PDC when the rate of data transmission changes.
- Minor: Fixed issue where time is displayed incorrectly under some circumstances after manually setting it through TESLA Control Panel without an external time source connected.
- Minor: Fixed issue where time is displayed incorrectly when set to SNTP time source and a setting change is made to the Time screen. Time is displayed incorrectly until the unit is power cycled.

v1.9a – 2017-08-29

- Major – Correct issue where continuous disturbance recording (CDR) stopped a fixed period of time after being started. The worst case is 168 days after starting with the maximum number of channels monitored at the maximum rate.
- Minor – Corrected issue where the delay module in a logic function will assert/de-assert 1/2 cycle earlier than expected in some conditions.
- Minor – Corrected issue with a logic function asserting/de-asserting 1/2 cycle later than expected when it uses another logic function as an input.

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v1.9 – 2016-12-18

- Enhancement: Add support for leap second.
- Minor – correct issue where trend view shows negative value on harmonic and THD views under certain conditions.

v1.8a - 2015-09-28

- Major –The DNP3 Binary Input (Object Group 1, 2) states all changed to default after a unit power cycle or reboot.

v1.8 - 2015-09-15

- Enhancement: Change minimum harmonic threshold from 3% to 1% to allow triggering and recording below 3%.
- Enhancement: Increase the high speed recording pre-fault maximum setting to 8 seconds.
- Enhancement: Add an alarm output trigger for time sync loss.
- Enhancement: Add an alarm output trigger for IEC 61850 communication failure.
- Enhancement: Add IEEE C37.118-2011 compatibility on the IRIG input.
- Enhancement: Add support for the model 401025 AC Current Input Module (CE compliant model to be released soon).
- Enhancement: Add support for the model 401026 AC Voltage Input Module (CE compliant model to be released soon).
- Major -Corrected issue with date not incrementing correctly on some units when no IRIG or Sntp reference is available.
- Major-Corrected issue with PMU inconsistently rounding fractions of a second.
- Minor - Corrected issue with Sequence of Events reporting conditionally suspended for masters 2 and 3 in multiple DNP3 master applications.
- Minor - Improve system diagnostic file retrieval via network ports.

CLASSIFICATION OF CHANGES MADE

The issues fixed in software / firmware upgrades are classified as defined below. While it is always the user's decision to upgrade installed products, these classifications provide a guideline for the need and priority of the upgrade.

Critical: Critical changes fix issues/problems that prevent the basic operation of the device and have no workaround. Critical changes merit a product upgrade as soon as possible, if that function is being used under the conditions causing the issue

Major: Major changes fix problems that prevent the basic operation of the device but do have a workaround. Any major changes merit a product upgrade as soon as possible if the function is being used under the conditions causing the issue and a workaround is not acceptable.

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Minor: Minor changes fix non vital issues that do not prevent the basic operation of the device and may or may not have a workaround. Product upgrades for such changes are not necessary unless they apply to and are needed by the user.

Enhancement: Feature enhancements add a capability or extend existing capabilities of the product. Upgrades for such changes need be made only if and when that feature enhancement is desired.

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