Enlogic

Advantage & Secure

Release Notes | Document Version – 1.6

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SECTION 1 – GENERAL

1.1 Scope

The Release Notes for Advantage & Secure firmware version 3.2.4 are contained in this document.

1.2 Abbreviations and Acronyms

To help better comprehend this document, attached is a list of the key acronyms and abbreviations.

Acronym	Abbreviation
PDU	Power Distribution Unit
GUI	Graphical User Interface
SSH	Secure Shell Protocol
SNMP	Simple Network Management Protocol
SMTP	Simple Mail Transfer Protocol
LDAP	Lightweight Directory Access Protocol
CLI	Command Line Interface
FTPS	File Transfer Protocol Secure
MAC	Media Access Control
IP	Internet Protocol
SKU	Stock Keeping Unit
EMEA	Europe Middle East Asia Pacific
NA	North America

SECTION 2 – RELEASED FILES

2.1 Packaged File

Firmware	enlogic.fw
Checksum/ SHA256	86519fcea51f2992c072ee1aaaf01062353d18e0baf3f80af42a443f1a1bb9bb

2.2 Software Version

FIRMWARE VERSION – 3.2.4

SECTION 3 – PRODUCT FAMILY

Product Type	Description
Input Metered PDU (MI)	PDU with metering capability at the input of the PDU.
Monitored Switched (MS)	PDU with metering capability at the input of the PDU plus the ability to control outlets on and off.
Outlet Metered PDUs (MO)	PDU with metering capability per outlet.
Monitored and Switched per Outlet PDUs (MSPO)	PDU with metering capability per outlet plus the ability to control outlets on and off.
Inline Energy Meter (IEM)	Inline meter that provides metering capability at the input of the attached IT equipment.

SECTION 4 – SKUS SUPPORTED

Type	SKU Numbers
Input Metered PDUs (MI)	EN1315, EN1325, EN1326, EN1327, EN1330, EN1334, EN1337, EN1339, EN1341, EN1343, EN1345, EN1346, EN1350, EN1351, EN1354, EN1355, EN1356, EN1357, EN1381, EN1450, EN1451, EN1805, EN1805S, EN1806, EN1811, EN1814, EN1815, EN1821, EN1822, EN1823, EN1826, EN1827, EN1829, EN1850, EN1851, EN1853, EN1854, EN1855, EN1856, EN1880, EN1902, EN1906, EN1907, EN1908, EN1915, EN1917, EN1919, EN1926, EN1927, EN1932, EN1939, EN1940, EN1942, EN1950, EN1951, EN1952, EN1953, EN1955, EN1956, EN1980, EN1982, EN1983
Monitored Switched PDUs (MS)	EN2315, EN2316E, EN2317, EN2319, EN2324, EN2325, EN2326, EN2329, EN2333, EN2337, EN2339, EN2350, EN2351, EN2354, EN2380, EN2402, EN2403, EN2404, EN2450, EN2804, EN2804S, EN2808, EN2810, EN2812, EN2823, EN2850, EN2851, EN2852, EN2880, EN2881, EN2902, EN2907, EN2950, EN2951, EN2952, EN2953, EN2980, EN2982
Outlet Metered PDUs (MO)	EN5325, EN5329, EN5337, EN5380, EN5402, EN5808, EN5810, EN5850, EN5886, EN5952, EN5956
Monitored and Switched per Outlet PDUs (MSPO)	EN6324, EN6325, EN6326, EN6329, EN6333, EN6337, EN6338, EN6341, EN6350, EN6351, EN6353, EN6380, EN6381, EN6385, EN6386, EN6387, EN6399, EN6402, EN6404, EN6450, EN6602, EN6804, EN6804S, EN6808, EN6810, EN6812, EN6827, EN6829, EN6833, EN6834, EN6835, EN6850, EN6851, EN6852, EN6880, EN6881, EN6883,EN6885, EN6902, EN6905, EN6908, EN6909, EN6910, EN6911, EN6950, EN6951, EN6952, EN6954, EN6956, EN6957, EN6958, EN6959, EN6961, EN6962, EN6980, EN6982
Inline Energy Meter PDUs (IEM)	EZ1430, EZ1530, EZ1550, EZ1560, EZ1616, EZ1632, EZ1663, EZ1716, EZ1732, EZ1763
UPDUs (Universal Power Distribution Units)	EN13UA_20A3WYE, EN13UA_16A3WYE, EN13UA_20A1L-L, EN13UA_16A1L-N
1U/2U Horizontal PDUs	EN1862, EN1960, EN1962, EN1963, EN1964, EN1965, EN1966, EN2355, EN2854, EN2954, EN6354, EN6383, EN6957, EN6963
100 Ampere PDUs	EN19HA, EN19HB, EN19HC, EN19HD, EN19HE, EN19HF EN19JA, EN2990, EN29HB, EN6990, EN69HB, EN69HD, EN69HE, EN69HF, EN69HG, EN69HH
Residual Current Monitoring PDUs (RCM)	EN1470, EN6871, EN6872

SECTION 5 – PRODUCT DESCRIPTION

FEATURES	Input Metered (MI)	Outlet Switched (MS)	Outlet Metered (MO)	Metered and Switched per Outlet (MSPO)
Design • Low profile, space saving design. • Ultra-low-profile circuit breakers on most models • Adjustable tool-less mounting system	YES	YES	YES	YES
PDU Power Monitoring • PDU level watt hour power metering (kWh) • PDU level power measurements (W) • Input phase level power measurements (V, A, VA, kWh, pf) • Circuit Breaker level current measurements • High accuracy, metering capabilities • Persistent Data Log to record/view/report historical data. • User customizable alarm thresholds & notifications	YES	YES	YES	YES
Outlet Level Switching • Remote ON/OFF Power control by individual outlet • User defined power-on time delay to sequence IT equipment • Automatic sequencing to avoid inrush current overload. • Controlled with assignable roles and user access		YES		YES
Outlet Level Power Monitoring • Outlet level watt-hour energy metering(kWh) • Outlet level power measurements (V, A, VA, W, pf)			YES	YES
Environmental Management • Optional Plug and Play environmental sensors including temperature, humidity, and water leak.	YES	YES	YES	YES
Physical Security Management • Rack access monitoring with door contact switch • Customizable alarm thresholds and notifications	YES	YES	YES	YES
Network Management And Local Display Interface • Active LED display for power measurements • OLED display with high contrast ratio, easy to navigate menu and visual graphic bars for phase load balancing. • Full featured network management and alerting capabilities supporting HTTP, HTTPS, SSH, SNMP, FTP and SMTP. • Strong encryption, passwords and advanced authorization options including local permissions, LDAP, and Active Directory. • Daisy Chain up to 64 Rack PDUs, each up to ten sensors.	YES	YES	YES	YES
Branch Circuit Load Monitoring	YES	YES	YES	YES
Circuit Breaker Status		YES	YES	YES

SECTION 6 – UPDATED FEATURES

6.1 3.2.4 Firmware Upgrade

1. The new firmware version 3.2.4 is available at the nVent Enlogic website for download. It is mandatory for all users to download this file before initiating the firmware upgrade process.

2. For the existing customer the firmware upgrades should be performed in the following order for Advantage Series NMCs:
   - Verify if the existing firmware versions are 2.0.6.7/ 2.0.7.6 or below these versions.
   - Upgrade to the Firmware version is 2.0.6.7/ 2.0.7.6 , use the following process and upgrade to the latest firmware version 3.2.4 .
   - Upgrade Bridge firmware 3.0.0.2 using the update folder in the USB, or **enlogic.tar** using the WEBUI & FTPS.
   - From 3.0.0.2, [bridge firmware] flash new firmware 3.2.4 use **enlogic.fw** using USB, WEBUI & FTPS.
   - USB firmware upgrade option is recommended.
   - USB should be in FAT32 file system, no other files to be present during firmware upgrade.
   - It is recommended to upgrade the firmware always on standalone PDU.
   - If PDUs are daisy chained detach the daisy chain cable and then upgrade the firmware.

3. The firmware upgrades should be performed in the following order for Advantage Secure NMCs:
   - Firmware version 3.0.4.
   - From 3.0.4, to flash new firmware 3.2.4 use **enlogic.fw** using USB, WEBUI & FTPS.
   - USB firmware upgrade is recommended.
   - USB should be in FAT32 file system, no other files to be present during firmware upgrade.
   - It is recommended to upgrade the firmware always on standalone PDU.
   - If PDUs are daisy chained detach the daisy chain cable and then upgrade the firmware.

6.2 Firmware Assets from Firmware 3.1.3 Version Onwards

1. As opposed to previous firmware releases that used compressed or zipped files [.tar/.zip], firmware version from 3.1.3 and later will use the **enlogic.fw** format.

2. Improved ability for Advantage Series NMCs to work with Advantage Secure NMCs. This includes a change to the firmware upgrade file format which is now a '.fw' file rather than a '.tar' file.

3. Note that there will be two restarts during the upgrade procedure as opposed to the typical one when the bridge firmware is updated to the version 3.1.3 .

4. Previously stored configuration files cannot be used after updating to the new version 3.2.4 .

5. Due to underlying file system improvements made from firmware version 3.1.3, downgrades to a previous firmware version are not supported.

6. From firmware version 3.1.3 upgrade activity via USB, ensure that the USB does not contain the **update** folder.

7. If updating PDUs in a daisy chain configuration and one or more Node PDUs do not upgrade successfully, those Node PDUs will need to be individually updated. This can be done using the USB method.

8. PDUs cannot be Daisy chained from an NMC with an older firmware version to a newer firmware version 3.2.4.

9. From the 3.1.3 firmware version, hot swapping of NMCs is allowed only if both the PDUs are upgraded with the latest firmware version.

10. From firmware version 3.2.4, web pages now have a queuing system in place with the OpenSSL updates, so users will experience improved responsiveness of web pages.

11. From the firmware version 3.1.3 onwards, the MAC address appended to the DNS hostname was removed.

6.3 Firmware 3.2.4 - New Features

This section lists the new features released with firmware version 3.2.4.

1. **Residual Current Monitoring (RCM)** is a safety mechanism used in electrical systems to detect residual currents and identify potential risks. Firmware version 3.2.4 supports the monitoring of residual currents, which helps prevent electric shocks, fires, and equipment damage by enabling early fault detection and timely intervention. Enlogic PDUs now include RCM capabilities, adhering to the IEC 62020-1:2020 RCM standards. PDUs equipped with RCM feature a 1-channel RCM Type A/B, supporting various configurations and combinations, including single-phase or three-phase 32A rated PDUs. RCM features provides

   - Leakage Detection: Detects leakage currents in the electrical system.

   - Continuous Monitoring: Provides continuous monitoring of residual currents for early detection and maintenance.

   - Alarm Generation: Generates alarms when residual currents exceed predefined thresholds.

2. The **Single User Multiple Session (SUMS)** feature enables users to utilize the same login credentials to configure and monitor parameters across multiple sessions without logging out previous sessions of the same user. With the release of FW version 3.2.4, this functionality allows users to configure various parameters on different web pages. Once parameters are updated, the same values are reflected across all sessions upon navigating to respective web pages, improving efficiency. The system supports up to 10 sessions via WEBUI and REDFISH, maintaining performance despite the increase in session numbers.

3. **802.1X** is an authentication protocol that ensures secure network access through an ethernet port. With the release of FW 3.2.4, the PDUs now integrate IEEE 802.1X authentication, which is disabled by default. This protocol can be configured independently on each LAN port to provide secure access for the PDU. It verifies an ethernet port's identity using credentials or certificates. The 802.1X protocol uses the certificate uploaded from the Certificate Repository to authenticate the user. The PDU supports EAP-TLS, PEAP-TLS, and PEAP-MSCHAPv2 as authentication methods.

4. The **Zero Touch Provisioning (ZTP)** feature streamlines the configuration process for new PDUs deployed within a network, eliminating the need for manual intervention. With the release of version 3.2.4, Enlogic PDUs will incorporate ZTP as an effective solution for automating the deployment and configuration of PDUs in a network environment. Here are the key features:

   - Eliminates manual work: ZTP removes the need for manual deployment of PDUs, making the process more efficient.

   - Accelerates deployment: The automated nature of ZTP speeds up the deployment process.

   - Reduces errors: By automating the configuration, ZTP minimizes the errors that are often associated with manual configuration.

Additionally, the firmware supports various protocols and configurations to ensure seamless operation:

   - TFTP: The PDU firmware supports the Trivial File Transfer Protocol for downloading configuration files.

   - DHCP Options: The firmware supports DHCP Option 43 (Vendor Specific Information) and Option 60 (Vendor Class Identifier).

5. **Link Layer Discovery Protocol (LLDP)** - The firmware version 3.2.4 introduces the LLDP, which enables PDUs to broadcast identification, configuration, and capabilities over the network. This shared information assists in reducing the time required to integrate a new device into the Local Area Network (LAN) and provides essential details for troubleshooting various configuration issues. Our PDUs are configured to operate LLDP transfers exclusively in 'Transmission' mode. These transmissions occur every 10 minutes over the network. By default, LLDP is enabled on Ethernet ports 0 and 1. If a port switches to a daisy chain configuration, the transmission of LLDP packets will automatically stop on that port.

6. **Access Control List (ACL)** – The firmware 3.2.4 introduces an improved ACL feature, allows the administrator to create new roles with custom configuration. This customization includes configuring all/selective outlets/outlet groups control. Roles created with this custom configuration may be assigned to users as per the requirement. These users (with special access permission) shall be able to control assigned outlets/groups.

7. **The Overload Prevention** feature manages the load of an PDU strategically by turning off non-loaded outlets to maintain the overall load within a specified threshold range (between lower and upper threshold values). When the load connected to the PDU increases and exceeds the upper threshold, the feature turns off the respective outlets to mitigate the surge. By default, this threshold is set to half of the PDU's rated load, but it can be configured by an authorized user.

8. With the release of FW 3.2.4, the product portfolio now includes high amperage PDUs with support for 100 Amps and 64 Circuit Breakers (CB).

9. The release of firmware version 3.2.4 upgrades our PDUs to OpenSSH version 9.9. This update addresses vulnerabilities in earlier versions of OpenSSH and includes a fix for CVE-2023-48795, also known as the Terrapin Attack.

10. The release of FW 3.2.4 includes the implementation of eight new **Redfish URLs** in accordance with DMTF standards. URLs related to Account Services have been reinstated and are now operational.

Redfish GET URLS released with FW 3.2.4

SL. NO.	REDFISH URLs
1	/redfish/v1/Managers/1/Actions/Manager.DownloadConfiguration
2	/redfish/v1/PowerEquipment/PDUs/1/Actions/PowerShare
3	/redfish/v1/Managers/LogServices/SyslogEntries
4	/redfish/v1/Managers/1/LogServices/Log/Entries
5	/redfish/v1/PowerEquipment/PDUs/1/PhaseData
6	/redfish/v1/Chassis/1/Power/OutletGroups
7	/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/TotalEnergy
8	/redfish/v1/Chassis/1/Sensors/DeviceDetectionThreshold

11. With FW 3.2.4, in CLI/SSH:
    - Added new commands related to Residual Current Monitoring, Overload Prevention, 802.1X.

12. With FW 3.2.4, Web User Interface:
    - Includes an updated Web UI branded under nVent Enlogic, incorporating new corporate colors, features, and functionalities.
    - Includes new WEB UI screens related to Residual Current Monitoring, Overload Prevention, 802.1X, LLDP and Access Control List.

6.4 Enhancements

13. MIB Updates - With the release of the FW 3.2.4, the following OIDs are updated for
    - Residual Current Monitoring-
        - In the pduInputRcmTable - Aggregate of the number of entries equal to number of PDUs and number of RCM modules per PDU.
            - pduInputRcmEnabled
            - pduInputRcmModStatus
            - pduInputRcmThUpperWarning)
            - pduInputRcmThUpperCritical
            - pduInputRcmThResetThld
            - pduInputRcmThChangeDelay
            - pduInputRcmThCtrl
            - pduInputRcmThStatus
            - pduInputRcmCurrent
        - In the pduInputRcmSelfTestTable- Rcm Module Self-Test Enable, Schedule, LastRunTime,LastRunStatus etc.
            - pduInputRcmSelfTestEnable
            - pduInputRcmSelfTestFreq
            - pduInputRcmSelfTestHour
            - pduInputRcmSelfTestMinute
            - pduInputRcmSelfTestDay
            - pduInputRcmSelfTestMonth
            - pduInputRcmSelfTestNextRunTime
            - pduInputRcmSelfTestLastRunTime
            - pduInputRcmSelfTestLastRunStatus
            - pduInputRcmSelfTest
    - Overload Prevention
        - pduOlpConfigStatus
        - pduOlpConfigloadRating
        - pduOlpConfigThreshold
        - pduOlpConfigResetDuration

Other enhancements with Firmware version 3.2.4 include:

14. EdgeLEDColor remains unchanged after applying default settings.

15. The EdgeLEDColor command in CLI/SSH now includes an additional option, "DARK," which disables color on the edge display.

16. New trap codes for Outlet group power control.

17. The phase power alarm now produces events, traps, and syslog entries.

18. The process for uploading configuration and firmware files is consistent for Node PDUs.

SECTION 7 – KNOWN ISSUES

This section lists the known issues in the firmware version 3.2.4.

1. While uploading a Configuration File, choosing Syslog facilities – audit, alert, NTP, clock may cause the PDU to behave differently.

SECTION 8 – ADDITIONAL INFORMATION

This section lists some information about the firmware version 3.2.4.

1. In a daisy chain setup, bulk configuration could sometimes result in some latency.
2. Ensure that configuration files downloaded with firmware version 3.2.1 or earlier are not utilized on firmware version 3.2.4.
3. Once a task is completed, there is a delay in the event triggering time.
4. There could be latency in WEBUI performance when bulk set action is performed from Redfish.
5. In the event that any of the Node PDUs data becomes blank during a reboot scenario, it is recommended to perform an additional reboot on the specific PDU/NMC to restore it to its proper state.
6. If any PDUs contain more than 19 circuit breakers, the data will not appear on the seven-segment screen but will remain accessible through all other interfaces.
7. During role creation, if any outlets or outlet groups are assigned to the user, this information is not being stored in the configuration file.

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