



RELEASE NOTE For: MDS Master Station Firmware Version 9.1.5

RELEASE DATE: February 24, 2022

FIRMWARE

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<http://www.gegridsolutions.com/communications>

MDS™ Master Station COVERING FIRMWARE – REV 9.1.5

Overview

This section describes Software/Firmware updates for the MDS Master Station, noting changes since REV 9.1.3.

Products: MDS Master Station
Including: MPRS, MPRL, MPRU, MDPL
Firmware Version: 9.1.5

NOTE: 9.1.5 is a maintenance release resolving specific software issues described below. Customers using 9.1.3 or higher are recommended to update to 9.1.5.

Consult Orbit MCR/ECR Release Notes for additional information on Orbit features that may apply to Master Station (MPR) operation.

SPECIAL NOTICE FOR CUSTOMERS UPGRADING TO THIS VERSION (from pre-7.0)

As part of an enhanced security posture this release uses a SHA256 firmware certificate. When upgrading from earlier firmware versions (before 7.0) it is necessary to overwrite the previous GE MDS firmware certificate with this new one.

Related information:

- The new certificate can be found at the GE Industrial Communications website at https://www.gegridsolutions.com/Communications/MDS/software.asp?directory=Master_Station/Support_items
- Certificates can be loaded individually (see Certificate Management, at the bottom of the navigation pane)
- Certificates can be broadcast to a network using remote management.

IMPORTANT NOTES:

- This firmware applies to all MPR (MPRS/MPRL/MPRU/MDPL) except as described below
 - This firmware does NOT support Evolution/Migration Master station (serial-router).
- Once running 4.x or later system firmware, 3.x system firmware **cannot** be downloaded into the Master Station. To preserve the ability to boot back to 3.x firmware, **do not** overwrite your inactive 3.x firmware image.
 - See the section labeled “Special Instructions: Booting to 3.x firmware in the inactive image (MPRS Only)” later in the release notes for detailed instructions.

- Both active and inactive Radio Modules have their own firmware that the MPR upgrades together and keeps in sync. The Radio modules use different versioning than the Master Station system firmware. See the firmware version list in the Overview section for the expected radio module firmware versions.
- When the Firewall experiences an error, all traffic is dropped with the exception of the HTTPS and SSH protocols. These protocols can be used to recover the device to a functional state.
- Customers running REV 9.1.3 with IP/port binding to ssh, http, or https must upgrade REV 9.1.5.

Supported Radio Modules

- **MDS Master Station with LN Radio Modules (MPRL)**
 - LN1B
 - LN1C
 - LN2X
 - LN4A
 - LN4C
 - LN4E
 - LN7A
 - LN9A
 - LN9C
- **MDS Master Station with LW Radio Modules (MPRL)**
 - LW7
- **MDS Master Station with SD Radio Modules (MPRS):**
 - SDM4A
 - SDM4B
 - SDM4C
 - SDM4D
 - SDM9C
 - SDM9K
- **MDS Master Station with Unlicensed 900MHz Radio Modules (MPRU)**
 - NX
- **MDS Dual Protected Master Station with LN Radio Modules (MDPL)**
 - LN1C

New Features

- N/A

Changes to Existing Features

- N/A

Resolved Issues (Fixed)

- **MDS Master Station since v9.1.3:**
 - Binding an IP/interface to a user interface service (HTTP,HTTPS,SSH) is supported again. This feature was non-functional in FW 9.1.3 and caused the Orbit to reboot at roughly 1 hour intervals. [5397]
 - Routing instance names with a hyphen character ('-') were causing a routing malfunction. A parsing issues was resolved. [5424]
 - GRE interfaces with an underlay-vrf configured failed to come up normally. A timing sequence issue was resolved. [5428]

Preserving ability to run previous configuration

New versions of Master Station code use updated configuration data models that are not backwards compatible with older releases. When a unit running a *previous* release is upgraded to this release, a snapshot of its configuration is made and stored on the unit called "Auto". The unit's configuration is automatically migrated to newer data model. The user can downgrade back to the *previous* firmware version only by choosing to revert to the legacy configuration snapshot as described here. Any firmware can be loaded that is greater than or equal to the Factory snapshot version, but may require a different firmware cert be loaded (See SPECIAL NOTICE FOR CUSTOMERS UPGRADING TO THIS VERSION section above).

To maintain ability to run previous firmware follow the procedure below.

1. Should it be determined that reverting to the previous firmware is necessary, perform the following command on the CLI to reboot to the old firmware, and restore the system using a configuration snapshot. The Auto or a user snapshot can be used if available, but the factory snapshot will always be available.

```
> request system recovery rollback which-image { inactive } snapshot Auto
```

2. You will be prompted to confirm this action:
The current system configuration will be erased and replaced with the snapshot. Proceed? [no,yes]
3. Type 'yes' and press enter, and the system will restart to the *previous* configuration
4. Note that the recovery operation *may* include restoration of a previous SHA1 FW certificate. If so, then it will be necessary to reinstall the new SHA256 FW certificate before newer software can be downloaded again.

Special Instructions: Booting to 3.x firmware in the inactive image (MPRS Only)

To switch between 3.x firmware and 4.x system firmware on an MPRS follow the procedure below.

1. IMPORTANT: Once you are running 4.x firmware or greater, be sure to not overwrite the 3.x firmware in the inactive firmware location, or you will not be able to revert back to that version. E.g. copying active firmware to inactive location, or installing a new version to the inactive firmware location.
2. Should it be determined that reverting to the old 3.x firmware is necessary, perform the steps from the "Preserving ability to run previous configuration" section above to load the inactive image with a previous snapshot.

Known Errata

- **MDS Master Station Platform (including MPRS/MPRL/MPRU/MDPL):**
 - o Syslog is not fully compliant with RFC5424. [1028,1033]
 - o A QoS modify policy will act like it is automatically applied to all interfaces [2023]
 - o When using QoS, you cannot have a shaping policy as the next-policy of priority policy. [1544]
 - o MPRS does not support multiple TCP connections in TCP multi-host mode. [1934]
 - o Changes may not be applied immediately when changing Data Device Mode to either DCE or CTS Key mode. They will be applied after a reboot or failover. [1267,1377]
 - o A QoS modify policy is not tied to an interface and must be deleted to disable it. [1542]
 - o QOS does not operate handle the DSCP field correctly. To ensure proper QOS priority use the TOS equivalent. [2304]
 - o When making changes to QOS settings, changes will not occur after committing if traffic flow is already in progress. Reset the interface (or reboot the device) to ensure that changes will be in effect. [1876]
 - o When configuring the Static Routes Next Hop parameter, leave the Outgoing Interface blank. Otherwise, the routing table will not be properly configured and data passing may stop. [2139]
 - o Payload buffer delay is only applicable in x710 mode. [3972]
 - o When performing file transfers, if the status does not appear to update or looks inconsistent, a reboot of the system may be required to clear the failed state. When in the failed state the status icons in the upper left corner of the web UI will also be non-functional. [3965]

- o If a unit repeatedly fails to receive an over the air broadcast reprogram, connect to the unit and copy the active image over the inactive image to attempt to recover the state. Restart the broadcast reprogramming if it has stopped. [3681]
- o Destination NAT is not currently supported for IPv6. [4196]
- o Do not use MPRS to broadcast an update to the DLINK encryption phrase. [4259]
- o In a very large LN network with multiple polling threads, it may be necessary to reduce the traffic entering the LN AP prior to initiating broadcast reprogramming. [4180]
- o When performing bulk changes to the SNMP service if the commit operations fails, it may be necessary to break the changes up into a set of smaller commits. You must discard current changes (or reboot) and enter the changes in smaller sets. [4520]
- o On a Web-based file transfer (From Local File) through remote proxy, if the WebUI gets stuck in the file transfer state, performing the operation via CLI can restore operation. The CLI file transfer request need not be successful. [4395,4506]
- o If broadcast reprogramming does not complete, restart the transfer to continue reprogramming. [4283]
- o If TACACS+ user authentication is used, and the server is routable, but not reachable, the system may lock up and reboot while attempting to authenticate a user. [4611]
- o Exports of large serial captures might fail. Retry the operation capturing data for a smaller interval of time. [4198]
- o For a system with LW radios, if degraded performance is observed immediately following a radio configuration change, effect recovery by disabling then re-enabling the LwRadio interface. [4712]
- o The Orbit MCR 6 Ethernet port offering does not include physical serial ports. Serial over USB is provided and is configured as COM1 in the Orbit user interface. [3613]
- o Multiple IPsec connections using the same local-ip-subnet are not supported. [2769]
- o VRF interface packet statistics may not match the member interfaces. Use the member interface statistics instead. [5034]
- o When using OpenVPN server, if multiple clients connect with the same client certificate, the assigned IP address will be in conflict. Ensure unique certificates at all clients and restart the OpenVPN server. [5043]
- o If using Orbit OpenVPN client, and the client status becomes stuck in the reconnecting state for a prolonged time, the client on the Orbit must be manually restarted. [5045]
- o If an interface is a VLAN trunk, changes to what VLANs are a part of the trunk are not updated after the initial commit. As a workaround, configure as not a trunk, commit, then configure the desired vlans. Alternatively you can reboot the unit to get it into the correct state. [5267]
- o Firewall filters that have a layer 2 rule can only be applied to a bridge or VLAN interface. They will not be displayed in the tab complete or pulldown menus for other types of interfaces. [5276]

Operational Notes and Limitations

- **MDS Master Station Platform (including MPRS/MPRL/MPRU/MDPL)**
 - o While the MDS Master Station supports management and routing via IPv6, not all services have support for IPv6. [1781]
 - o A com port configured as Console mode only supports 8N1 formatting even though the serial settings can be set otherwise, operates correctly when in data mode. [1326]
 - o SCEP operations require certificate information to contain a Common Name, otherwise the operation will fail. No direct indication of failure is provided. [2052,2408]
 - o On a Microsoft CA server, the SCEP template used should not include Extended Key Usage. [2053,2409]
 - o The “\” character is an escape character for the CLI. If you want to enter a “\” into a text field (such as a user password), you will need to use “\\”. [1234]
 - o If web page display seems to render incorrectly, try refreshing the page. [1783]
 - o Timeout of MODBUS transactions, can cause dropped TCP connections. Potential fixes to increase poll rate or increase transaction timeout. [1646]
 - o If a remote unit is not responding to broadcast reprogram, connect to it directly via ssh or web and reset the remote management service. [1804]
 - o Header compression is not recommended for large serial polled system or system with only broadcast downstream messaging. [1951]
 - o In a LN system, if modulation is forced to 64 QAM we recommend enabling FEC (forward error correction). [1327,1405]

- o Broadcast firmware push tries to keep pushing data until all data has been pushed, but if it takes too many errors it may have to be re-initiated. [1459]
- o When configuring L7W (Licensed 700MHz Wide), do not set NIC-id. It is not supported in this release and will prevent link establishment. [3747]
- o Current release of MPRL NIC module hardware does not set the TX LED correctly, if operating in simplex mode. It is constantly on even when the NIC is receiving. [1165]
- o With configuration change of radio parameters, an entire poll cycle may be needed in LN advanced polling mode. [1940]
- o Operating as a Repeater with local-data when using modem "none" may not work properly when using SDM9C or SDM9K Radio Modules. In this case, set the repeater mode to "repeater" instead of "repeater-with-local-data". This does not apply when using SDM4B or SDM4C Radio Modules. For these modules, "repeater-with-local-data" should be used. [542]
- o If the operational mode of the radio is changed (e.g. from transparent to packet-with-mac), all mode specific parameters will assume their default values, even if previously set to a different value (e.g. MAC AP vs. Remote). [611]
- o An SD Radio Module configured as a Dlink root will not send local Dlink messages over the air if the radio is also configured for Repeater Mode "repeater". An SD repeater that is also a Dlink root must be set to "repeater-with-local-data". [750]
- o When using PulseNET or PulseNET Enterprise to monitor an MPRS in Packet w/ MAC mode, the Passive Collection Repeat Interval (in PulseNET) must be changed from the default 5000ms to a recommended value of 130000ms. This value must be changed for EACH MPRS being monitored in PulseNET. [1328]
- o An MPRS in transparent mode using ip-payload may require a reduction in the transparent-rx-timeout value, if the data streams are longer than 1480 continuous bytes. [1215]
- o When operating in RTS keying mode, full-duplex operation is not supported. For full-duplex operation, continuous keying must be used. [324]
- o When operating MPRS as a DATAKEY Repeater with SDx/x710 radios as remote endpoints in 9600 modem, for proper operation we recommend that the following parameters be configured in the remotes:

SDx/SDMS Polling Remote SCD: 8ms

x710/SDx Remote SCD: 12ms

SDx/SDMS Polling Remote and x710/SDx Remote PTT

For baud 96008N1: 0ms

For baud 96008E1: 4ms

When operating the SDMS as a CKEY Repeater with SDx/x710 radios as remote endpoints in 9600 modem, for proper operation we recommend that the following parameters be configured in the remotes:

SDx/SDMS Polling Remote SCD: 6ms

x710/SDx Remote SCD: 8ms

[762]

- o When operating as a repeater in x710 or transparent mode, using modem 9600 and baud rate 9600-8E1, the new repeater-tolerance parameter should be set to 'custom' to reduce errors. [758]
- o Due to a limitation of SD data compression when operating with certain modems, this feature has been removed. [825]
- o MPRS (4B) receive frequencies using exact multiples of 25MHz (400.000, 425.000, 450.000, 475.000, and 500.000MHz), result in degraded sensitivity and performance. [700]
- o On MPR, if SD interface returns error about unsupported mode, in some cases this is erroneous and can be ignored. There can be errors in the detection of the SD nic type that manifest this way. [2022]
- o MPR VSWR support for LN 100MHz and 200MHz is not supported. [3082]
- o UDP Iperf server does not return a report. Use TCP mode to see bandwidth. [3223]
- o For the LW radio in the MPR, the LED behavior on the card may not be as expected. [1844]
- o If there is an error downloading firmware from an HTTP server, the unit may require a reboot. [3580]

- o In the event of Web display issues, try clearing the browser cache. [3505]
- o When configuring custom layer-2 protocol filters use 0x as a prefix when entering the value as Hex, otherwise enter the decimal value. Example for ARP: Enter 0x0806 or 2054. [1246]
- o STP is not functional over interfaces belonging to a VLAN. [3324]
- o While MDS Orbit supports management and routing via IPv6, not all services have support for IPv6. [1672]
- o In the CLI, deleting a single entry in a leaf-list with bracket notation will delete the entire list. Do not use brackets in the command when deleting an element in the list. [93]
- o Performing and ICMP ping to a link local address requires that you specify a src-address [1385]



RELEASE NOTE For: MDS Master Station Firmware Version 9.1.3
RELEASE DATE: December 17, 2021

FIRMWARE

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Firmware Version: 9.1.3

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Supported Radio Modules

- **MDS Master Station with LN Radio Modules (MPRL)**
 - LN1B
 - LN1C
 - LN2X
 - LN4A
 - LN4C
 - LN4E
 - LN7A
 - LN9A
 - LN9C
- **MDS Master Station with LW Radio Modules (MPRL)**
 - LW7
- **MDS Master Station with SD Radio Modules (MPRS):**
 - SDM4A
 - SDM4B
 - SDM4C
 - SDM4D
 - SDM9C
 - SDM9K
- **MDS Master Station with Unlicensed 900MHz Radio Modules (MPRU)**
 - NX
- **MDS Dual Protected Master Station with LN Radio Modules (MDPL)**
 - LN1C

New Features

- **Features MDS Master Station since v8.3.3**
 - OpenVPN
 - Secure tunnel facility for VPN, providing alternative to IPsec
 - Support for both Server- and Client-side configurations
 - VRF
 - Enables layer-3 segmentation of the network via one or more isolated routing instances
 - VRF is implemented as a new virtual interface type; routable interface types are added to a VRF instance as members
 - Support for VRF aware DMVPN, BGPv4, RIPv2 and OSPFv2
 - Support for VRF aware ping and ssh
 - Separate VRF User's guide (publication 05-7230A01) is available with detailed application examples
 - TCP Keepalive on Terminal Server
 - Helps determine if a link is down and a connection should be re-routed
 - Enabled as an optional feature under Serial=>Terminal Server=>TCP-Client
 - Configurable parameters for idle time, interval, and maximum count of missed TCP acks
 - Ping can now operate within a VRF to allow monitoring of a network path availability/reachability over an interface that is within that VRF.
 - Orbit TLS/SSL Server now allows direct user control over which cipher suites to use (e.g., restricting use of static key ciphers per guidance for secure deployments)

Changes to Existing Features

- N/A

Resolved Issues (Fixed) & Improvements

- **MDS Master Station since v8.3.3:**
 - Security updates.
 - OpenVPN robustness improvements were added. [5043] [5045]
 - Broadcast Reprogramming: General robustness improvements.
 - VRF Robustness and WebUI improvements.
 - Multiple IPsec connections with same local-ip-subnet now work. [2769]
 - VLANs now work properly with SFP. [5015]
 - LED behavior was incorrect for SFP operation. [5035]
 - Resolution of reduced packet throughput during saturation tests.
 - Wizards: VPN Wizard can now properly configure Site-to-Site GRE+IPsec VPN.
 - Wizards: Access Control List Wizard now visually updates properly after editing an ipv4 address.
 - Spectrum Analyzer did not display initially unless web page was refreshed.
 - SAF route table was missing from Web UI displays.
 - Importing a pki cert (key) from WebUI got stuck in xfers and cancel did not recover.
 - Modbus Terminal Server operation could cause a watchdog timeout reboot.
 - Issue with inability to clear “log full” condition resolved.
 - ARP probe is now handled correctly in ARP caching.
 - MPRL units now recover gracefully from a persistent single NIC board communication failure.
 - Export of Serial Capture (from serdump) now works correctly. [5037]
 - SNMP memory leak
 - Web UI tool-tips are now working (broken in 8.3.3)
 - Web UI now properly updates after importing CA Certificate
 - Issue with bad remote syslog configuration causing periodic ~7min reboots
 - Serdump debug facility now displays correctly for MODBUS ASCII conversion.
 - Cancel Reprogramming operation failed to cancel
 - Alarm LED failed to clear after momentary alarm, when current alarms list quickly transitioned to empty.
 - IPsec VPN: Periodic failure msg when using conditional operation
 - WebUI SCEP renewal requests

Preserving ability to run previous configuration

New versions of Master Station code use updated configuration data models that are not backwards compatible with older releases. When a unit running a *previous* release is upgraded to this release, a snapshot of its configuration is made and stored on the unit called “Auto”. The unit’s configuration is automatically migrated to newer data model. The user can downgrade back to the *previous* firmware version only by choosing to revert to the legacy configuration snapshot as described here. Any firmware can be loaded that is greater than or equal to the Factory snapshot version, but may require a different firmware cert be loaded (See SPECIAL NOTICE FOR CUSTOMERS UPGRADING TO THIS VERSION section above).

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2. You will be prompted to confirm this action:
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 - o Operating as a Repeater with local-data when using modem “none” may not work properly when using SDM9C or SDM9K Radio Modules. In this case, set the repeater mode to “repeater” instead of “repeater-with-local-data”. This does not apply when using SDM4B or SDM4C Radio Modules. For these modules, “repeater-with-local-data” should be used. [542]
 - o If the operational mode of the radio is changed (e.g. from transparent to packet-with-mac), all mode specific parameters will assume their default values, even if previously set to a different value (e.g. MAC AP vs. Remote). [611]
 - o An SD Radio Module configured as a Dlink root will not send local Dlink messages over the air if the radio is also configured for Repeater Mode "repeater". An SD repeater that is also a Dlink root must be set to “repeater-with-local-data”. [750]
 - o When using PulseNET or PulseNET Enterprise to monitor an MPRS in Packet w/ MAC mode, the Passive Collection Repeat Interval (in PulseNET) must be changed from the default 5000ms to a recommended value of 130000ms. This value must be changed for EACH MPRS being monitored in PulseNET. [1328]
 - o An MPRS in transparent mode using ip-payload may require a reduction in the transparent-rx-timeout value, if the data streams are longer than 1480 continues bytes. [1215]

- o When operating in RTS keying mode, full-duplex operation is not supported. For full-duplex operation, continuous keying must be used. [324]
- o When operating MPRS as a DATAKEY Repeater with SDx/x710 radios as remote endpoints in 9600 modem, for proper operation we recommend that the following parameters be configured in the remotes:

SDx/SDMS Polling Remote SCD: 8ms

x710/SDx Remote SCD: 12ms

SDx/SDMS Polling Remote and x710/SDx Remote PTT

For baud 96008N1: 0ms

For baud 96008E1: 4ms

When operating the SDMS as a CKEY Repeater with SDx/x710 radios as remote endpoints in 9600 modem, for proper operation we recommend that the following parameters be configured in the remotes:

SDx/SDMS Polling Remote SCD: 6ms

x710/SDx Remote SCD: 8ms

[762]

- o When operating as a repeater in x710 or transparent mode, using modem 9600 and baud rate 9600-8E1, the new repeater-tolerance parameter should be set to 'custom' to reduce errors. [758]
- o Due to a limitation of SD data compression when operating with certain modems, this feature has been removed. [825]
- o MPRS (4B) receive frequencies using exact multiples of 25MHz (400.000, 425.000, 450.000, 475.000, and 500.000MHz), result in degraded sensitivity and performance. [700]
- o On MPR, if SD interface returns error about unsupported mode, in some cases this is erroneous and can be ignored. There can be errors in the detection of the SD nic type that manifest this way. [2022]
- o MPR VSWR support for LN 100MHz and 200MHz is not supported. [3082]
- o UDP lperf server does not return a report. Use TCP mode to see bandwidth. [3223]
- o For the LW radio in the MPR, the LED behavior on the card may not be as expected. [1844]
- o If there is an error downloading firmware from an HTTP server, the unit may require a reboot. [3580]
- o In the event of Web display issues, try clearing the browser cache. [3505]
- o When configuring custom layer-2 protocol filters use 0x as a prefix when entering the value as Hex, otherwise enter the decimal value. Example for ARP: Enter 0x0806 or 2054. [1246]
- o STP is not functional over interfaces belonging to a VLAN. [3324]
- o While MDS Orbit supports management and routing via IPv6, not all services have support for IPv6. [1672]
- o In the CLI, deleting a single entry in a leaf-list with bracket notation will delete the entire list. Do not use brackets in the command when deleting an element in the list. [93]
- o Performing and ICMP ping to a link local address requires that you specify a src-address [1385]