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HiOS: HTML - Rail Data Diode (RDD) Configuration John M - 2024-09-02 - HiOS

This guide is designed to step you through the configuration of the RDD Hirschmann product. The RDD consists of 2 routers in the same enclosure, with traffic only being allowed from the IN router to the OUT, so UDP is the only protocol that is permitted.

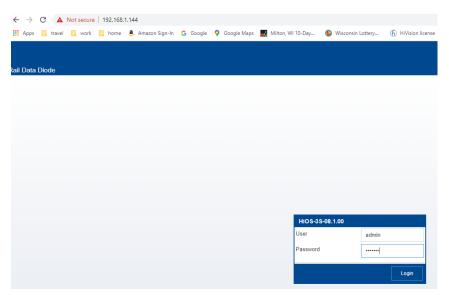
HiView/HiDiscovery will be needed to follow this guide along with 2 computers.

Configuring the IN Router

1. Give the IN side of the RDD an IP address with HiDiscovery.

| Signal | Configura | Password | MAC Address | IPv6 Address (Link local) | IP Address 🔻 | Netmask | Gateway | Type | Product |
|--------|--|----------|-------------------|---------------------------|---------------|--------------------|-------------|----------------|----------------------------------|
| | v | V | 64:60:38:47:82:00 | | 192.168.1.244 | 255.255.255.0 | 192,168.1.1 | rngmt | RDD20-1400A-SUUV999HHE3S |
| | V | | EC:E5:55:68:58:E8 | | 192.168.1.98 | 255.255.255.0 | 0.0.0.0 | mgmt | EAGLE20-0400999TT999SCCZ9HSE3F |
| | Image: A set of the set of the | | EC:E5:55:D&F8:C0 | | 192.168.1.81 | 255.255.255.0 | 0.0.0.0 | mgmt | OS20-002800T5T5T5-T88Y999GMSE3S |
| | \checkmark | | EC:E5:55:C8:59:30 | | 192.168.1.22 | 255.255.255.0 | 0.0.0.0 | mgmt | RED25-04002T1TT-TDDZ9HDE2S-81-SA |
| | Image: A second s | | EC:65:55:84:9F:DE | | 192.168.1.21 | 255.255.255.0 | 192.168.1.1 | mgmt | RSP20+11003Z6TT+SCCY9HSE25 |
| | Image: A start of the start of | | ECE5:55:36/70.88 | | 10.10.10.3 | 255.255.255.0 | 10.10.10.1 | mgmt | RS20-1600M2M2SDAEHH |
| | | | | | | HiView - Conf | igure | | × |
| | | | | | | MAC address | | 64:60:38:47:82 | 00 |
| | | | | | | Name | | RDD-6460384 | 78200 |
| | | | | | | IPv6 Address (Link | | 1 C | |
| | | | | | | IP address | | 192.168.1.144 | |
| | | | | | | Netmask | | 255.255.255.0 | |
| | | | | | | Gateway | | 0.0.0.0 | |
| | | | | | | | OK | Cancel | |

2. Login to the GUI of the switch.



3. Go to Routing/global and turn on routing then click the write button.

| Navigation 4 | | |
|--------------------|-----------------------------------|----------------------|
| ک ا 🏖 🔇 🕞 🚥 ا 📻 🛈 | Routing Global | |
| Filter 👻 🗙 | Operation | |
| C Time | 💿 On 🔘 Off | |
| | Routing profile | |
| Device Security | Next routing profile | ipv4RoutingDefault 💌 |
| Network Security | | |
| Switching | Current routing profile | ipv4RoutingDefault 👻 |
| (→) Routing | ICMP filter | |
| Global | Send echo reply | S. |
| L Interfaces | Send redirects | Ś |
| | Rate limit interval [ms] | 1000 |
| Router Discovery | Rate limit burst size | 100 |
| RIP | Configuration | |
| | File transfer source interface | - v |
| Routing Table | Source routing | |
| Tracking | Information | |
| L3 Relay | Default TTL | 64 |
| Loopback Interface | | |
| | | |
| L3-Redundancy | | V 2 |
| | | |

4. Go to routing/interfaces/configuration and assign the IP addresses to the interfaces used and click write. Refresh to make sure the settings are correct. If an IP address was assigned to the port currently used to communicate to the switch the computer IP will have to be changed to the same subnet of the IP that was assigned. This will also be the new IP address to login to the switch and the gateway IP of the computer. Note: Use the wizard to configure virtual interfaces/VLANs.

| avigation | | | | | | | | | | | | | upe |
|---|-----|---------------------------------|------|---------|-------------|--------------|---------------|---------|-----------|---------------------------|-----------|----------------------|------------------|
| | R | outing Interfaces Configuration | | | | | | | | | | (ĥ) HIRS | |
| bar 👻 | - ۲ | Port | Name | Port on | Port status | IP address | Netmask | Routing | Prany ARP | Netdirected broadcasts | MTU value | ICMP unreachables | ICMP redirect |
| nne 📝 | ^ D | | | 8 | up | 192.168.10.1 | 255,255,255.0 | · @ | | | 1,500 | 8 | R |
| Device Security | | 1/2 | | R | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | R | R |
| | | 1/3 | | R | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | R | R |
| Network Security | | 1/4 | | R | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | R | ß |
| X Switching | | 1/5 | | 8 | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | 8 | R |
| Routing | | 1/6 | | R | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | 8 | ×. |
| Cisbal | | 1/7 | | 8 | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | 8 | R |
| | | 1/8 | | 8 | up | 10,10,10,1 | 255.255.255.0 | 8 | | | 1,500 | 8 | S |
| ARP Router Discovery RIP OSPF Routing Table | | | | | | | | | | | | | |
| L Tracking | | | | | | | | | | | | | |
| L3 Relay | | | | | | | | | | | | | |
| Loopback Interface | | | | | | | | | | | | | |

5. Go to Routing/ARP/current and write down the MAC for the IP address that will connect the 2 Routers in the RDD, this will be needed when configuring the out Router .

| Navigation 4 | | | | | | |
|---|----|------------|---------------|-------------------|---------------|---------|
| 📚 🤱 🛃 🗊 281 🕕 🚺 | AF | RP Current | | | | |
| Filter 🗙 | | Port | IP address | MAC address | Last updated | Туре |
| | | 1/1 | 192.168.10.1 | 64:60:38:47:b2:05 | 3d 6h 35m 17s | local |
| Time | | 1/1 | 192.168.10.10 | e4:b9:7a:0c:4a:f5 | 3d 6h 29m 58s | dynamic |
| Device Security | | 1/8 | 10.10.10.1 | 64:60:38:47:b2:0c | 3d 6h 35m 17s | local |
| (→ ⁺ _↓ ←) Routing | | | | | | |
| Global | | | | | | |
| Global L Interfaces Configuration | | | | | | |
| Global Interfaces | | | | | | |
| Global L Interfaces Configuration | | | | | | |

6. Go to Router/ARP/Static and add an entry click active and write. This step will have to be done after the MAC of the OUT interface connecting to routers is known.

| Navigation • | | | | | |
|------------------|----------------|--------------|---------|--------------------|-----|
| S & A P 20 1 | ARP Static | | | | |
| Filter 👻 🗙 | IP address MAC | address Port | Active | | |
| Basic Settings | | | | | |
| 🕝 Time | | | | | |
| Device Security | | | | | |
| Retwork Security | | | | | |
| Switching | | | | | |
| Routing | | Crea | te | | |
| Global | | IP add | ress | 10.10.10.2 | |
| | | MAC a | oddress | 64.60.38.47.b2.j4c | |
| | | | | OK Cancel | |
| Global | | _ | | | |
| Current | | | | | |
| Static | | | | | |
| Router Discovery | | | | | |
| RIP | | | | | |
| OSPF | | | | | |
| Routing Table | | | | | |
| Tracking | | | | ✓ 3 | ₩ ₩ |
| L3 Relay | | | | | |

7. Make sure the new route shows up in the current tab which may need to be refreshed.

| Navigation • | | | | | | |
|--------------------------------|----|------------|---------------|-------------------|---------------|---------|
| 📚 🤱 👰 🕞 294 拱 🛈 | AF | RP Current | | | | |
| Filter 👻 | | Port | IP address | MAC address | Last updated | Туре |
| | | 1/1 | 192.168.10.1 | 64:60:38:47:b2:05 | 3d 6h 52m 58s | local |
| Basic Settings | | 1/1 | 192.168.10.10 | e4:b9:7a:0c:4a:f5 | 3d 6h 49m 26s | dynamic |
| 🥱 Time | | 1/8 | 10.10.10.1 | 64:60:38:47:b2:0c | 3d 6h 52m 59s | local |
| Device Security | | 1/8 | 10.10.10.2 | 64:60:38:47:b2:4c | 3d 6h 52m 59s | static |
| Switching Routing Global | | | | | | |
| L Interfaces | | | | | | |
| | | | | | | |
| | | | | | | |
| Global | | | | | | |

8. Add a static route 0.0.0.0/0 with the next hop IP of the OUT connecting interface click ok,

make sure it is active and click the write button.

| B L (2) F 298 | i | Ro | uting Table | | | | | | | | | h |) н |
|--------------------------------------|----|-----|--------------|-----------------|--|------------------------|----------------------|----------|------------|--------|--------------------|------------|--------|
| ilter | ×X | | onfiguration | 1 | | | | | | | | | |
| Basic Settings | í | Pro | aference | 1 | | | | | | | | | |
| Dime | | | Port | Network address | Netmask | Next hop IP address | Туре | Protocol | Preference | Metric | Last update [s] | Track name | Active |
| Device Security | | | 1/8 | 10.10.10.0 | 255.255.255.0 | 10.10.10.1 | local | local | 0 | | 3,688 | | |
| Network Security | | | | 192.168.10.0 | 255.255.255.0 | 192.168.10.1 | local | local | 0 | | 4,026 | | Ø |
| L Interfaces | | | | | Netmask Next hop I Preference Track nam | e | 0.0.0.0 10.10.10.2 1 | | | | | | |
| Current Static | | | | | | | ок с | ancel | | | | | |
| Router Discovery | | | | | | | | | | | | | |
| RIP | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| - OSPF | | | | | | | | | | | | | |

Configuring the OUT Router

1. Give the OUT side of the RDD an IP address with HiDiscovery.

| Signal | Configura | Password | MAC Address | IPv6 Address (Link local) | IP Address | * | Netmask | Gateway | Туре | Product |
|--------|-----------|----------|-------------------|---------------------------|---------------|---|--------------------|---------|------------------------------|------------------------|
| | ✓ | V | 64:60:38:47:82:40 | | 192.168.1.144 | | 0.0.0.0 | 0.0.0.0 | mgmt | RDD20-1400A-SUUY999HHE |
| | | | | | | | | | | |
| | | | | | | | HiView - Conf | īgure | | × |
| | | | | | | | Name | | 64:60:38:47:8 RDD-6460384 | |
| | | | | | | | IPv6 Address (Link | | | |
| | | | | | | | IP address | | 192.168.1.144 | |
| | | | | | | | Netmask | | 255.255.255.0 | |
| | | | | | | | Gateway | | 0.0.0.0 | |
| | | | | | | | | ок | Cancel | |

2. Login to the GUI of the switch.

| | 📙 work 📃 home | a. Amazon Sign-In | G Google | 💡 Google Maps | Milton, WI 10-Day | Wisconsin Lottery | 6 HiVision licer |
|------------|---------------|-------------------|----------|---------------|-------------------|-------------------|------------------|
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| Data Diode | | | | | | | |
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| | | | | | HiOS-3 | S-08 1 00 | |
| | | | | | | S-08.1.00 | |
| | | | | | User | admin | |
| | | | | | | admin | |

3. Go to Routing/global and turn on routing then click the write button.

| Navigation 4 | | |
|----------------------------|-----------------------------------|----------------------|
| | | |
| | Routing Global | |
| Filter 👻 🗙 | Operation | |
| C Time | ⊙ On ⊖ Off | |
| | Routing profile | |
| Device Security | Next routing profile | ipv4RoutingDefault 👻 |
| Network Security | | |
| Switching | Current routing profile | ipv4RoutingDefault 👻 |
| (→) →→ Routing | ICMP filter | |
| Global | Send echo reply | R |
| L Interfaces | Send redirects | R. |
| | Rate limit interval [ms] | 1000 |
| Router Discovery | Rate limit burst size | 100 |
| RIP | Configuration | |
| | File transfer source interface | - v |
| Routing Table | Source routing | |
| Tracking | Information | |
| L3 Relay | Default TTL | 64 |
| Loopback Interface | | |
| Multicast Routing | | |
| L _{L3-Redundancy} | | |
| | | |

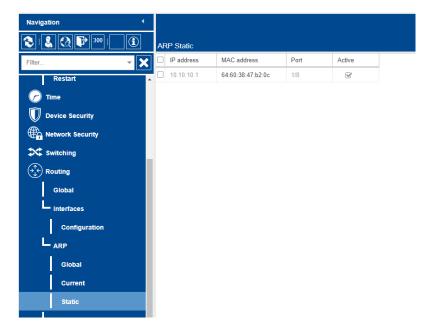
4. Go to routing/interfaces/configuration and assign the IP addresses to the interfaces used and click write. Refresh to make sure the settings are correct.

| Navigation | • | | | | | | | | | | | | | |
|------------------|-----|----|-----------------|---------------|--|-------------|--------------|---------------|---------|-----------|---------------------------|-----------|----------------------|-------------------|
| 😒 💄 🔕 📭 298 | -0 | Ro | outing Interfac | es Configurat | ion | | | | | | | | | |
| Filter | ~ X | | Port | Name | Port on | Port status | IP address | Netmask | Routing | Proxy ARP | Netdirected broadcasts | MTU value | ICMP unreachables | ICMP redirects |
| Restart | * | | 1/1 | | V | up | 192.168.20.1 | 255.255.255.0 | V | 0 | | 1,500 | V | 8 |
| 🕝 Time | | | 1/2 | | 8 | down | 0.0.0.0 | 0.0.0.0 | 0 | 0 | 0 | 1,500 | 8 | 8 |
| Device Security | | | 1/3 | | V | down | 0.0.0.0 | 0.0.0.0 | 0 | 0 | | 1,500 | V | 1 |
| Network Security | | | 1/4 | | 1. Alternative states and the states | down | 0.0.0.0 | 0.0.0.0 | | 0 | | 1,500 | 1 | S. |
| | | | 1/5 | | ¥ | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | ¥ | ¥ |
| Switching | | | 1/6 | | V | down | 0.0.0.0 | 0.0.0.0 | | | | 1,500 | V | V |
| | | | 1/7 | | 8 | down | 0.0.0.0 | 0.0.0.0 | 0 | 0 | 0 | 1,500 | 8 | 8 |
| Global | | | 1/8 | | Ø | up | 10.10.10.2 | 255.255.255.0 | e e | 0 | 0 | 1,500 | Ø | |
| Interfaces | | | | | | | | | | | | | | |
| Configuration | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

5. Go to Routing/ARP/current and write down the MAC for the IP address that will connect the 2 Routers in the RDD, this will be needed when configuring the IN Router.

| Navigation 4 | T | | | | | |
|--|----|------------|---------------|-------------------|---------------|---------|
| S 2 C P 298 1 | AF | RP Current | | | | |
| Filter 👻 🗙 | | Port | IP address | MAC address | Last updated | Туре |
| Restart | | 1/1 | 192.168.20.1 | 64:60:38:47:b2:45 | 1d 6h 55m 18s | local |
| 🕝 Time | | 1/1 | 192.168.20.10 | e4:b9:7a:0c:4a:f5 | 1d 6h 50m 00s | dynamic |
| 11me | | 1/8 | 10.10.10.2 | 64:60:38:47:b2:4c | 1d 6h 55m 18s | local |
| Network Security Switching Routing | | | | | | |
| Global | | | | | | |
| Configuration | | | | | | |
| | | | | | | |
| Global | | | | | | |
| Current | | | | | | |

6. Go to Router/ARP/Static and add an entry click active and write.

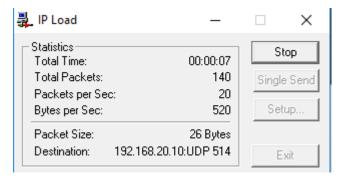


7. Make sure the new route shows up in the current tab which may need to be refreshed.

| Navigation | • | | | | | |
|-----------------------|------|-----------|---------------|-------------------|---------------|---------|
| 299 🔜 🔇 🕞 299 📻 🤅 | D AI | RP Curren | t | | | |
| Filter 🔻 | × - | Port | IP address | MAC address | Last updated | Туре |
| Restart | | 1/1 | 192.168.20.1 | 64:60:38:47:b2:45 | 1d 6h 59m 19s | local |
| | | 1/1 | 192.168.20.10 | e4:b9:7a:0c:4a:f5 | 1d 6h 50m 00s | dynamic |
| C Time | | 1/8 | 10.10.10.1 | 64:60:38:47:b2:0c | 1d 6h 59m 19s | static |
| Device Security | | 1/8 | 10.10.10.2 | 64:60:38:47:b2:4c | 1d 6h 59m 19s | local |
| Routing Global | | | | | | |
| Configuration | | | | | | |
| | | | | | | |
| Global | | | | | | |
| Current | | | | | | |
| | | | | | | |

Testing the configuration

1. Use a packet generator software to send UDP packets across the Router.



2. Use a computer connected to the OUT router running wireshark to capture the packets to make sure the traffic is being routed properly.

| Apply a dis | splay filter <ctrl- <="" th=""><th>></th><th></th><th></th><th></th></ctrl-> | > | | | |
|-------------------------------|---|----------------------|---------------|----------|-------------------------------|
| ю. | Time | Source | Destination | Protocol | Length Info |
| 1084 | 392.374996 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1085 | 392.375008 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1086 | 392.375018 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1087 | 392.375028 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1088 | 392.375039 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1089 | 392.375048 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1090 | 392.375058 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1091 | 392.375070 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1092 | 392.375079 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1093 | 392.375099 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1094 | 392.375109 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1095 | 392.375118 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1096 | 392.375139 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1097 | 392.375149 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1098 | 392.375159 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1099 | 392.375169 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1100 | 392.375178 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| 1101 | 392.375187 | 192.168.10.10 | 192.168.20.10 | Syslog | 68 abcdefghijklmnopqrstuvwxyz |
| Etherne Interne User Da | t II, Src: Del t Protocol Ver tagram Protoco | 1_38:bc:cc (34:e6:d7 | | | |