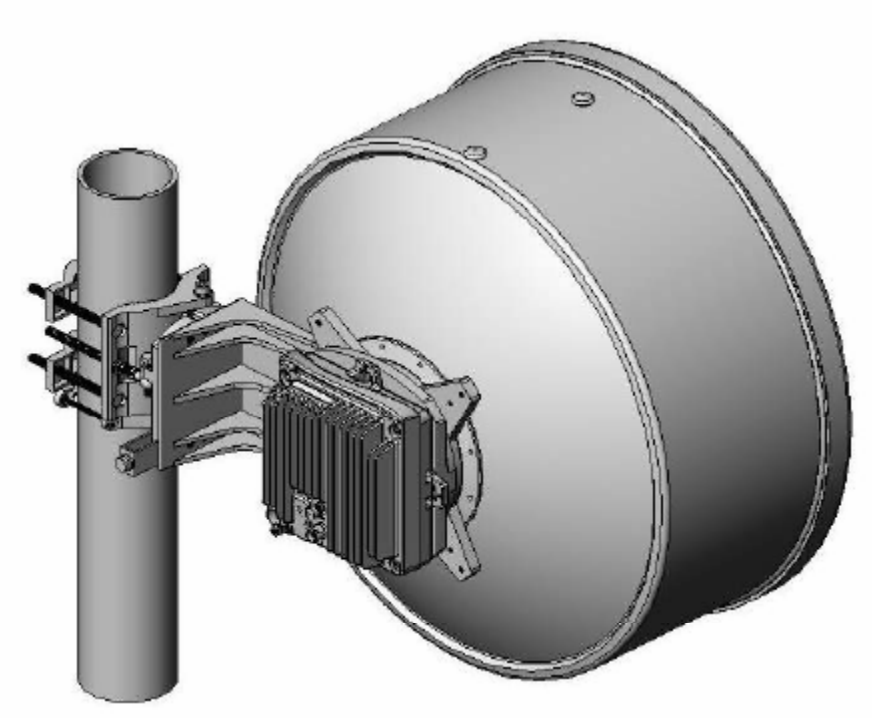
Installation and Setup Module

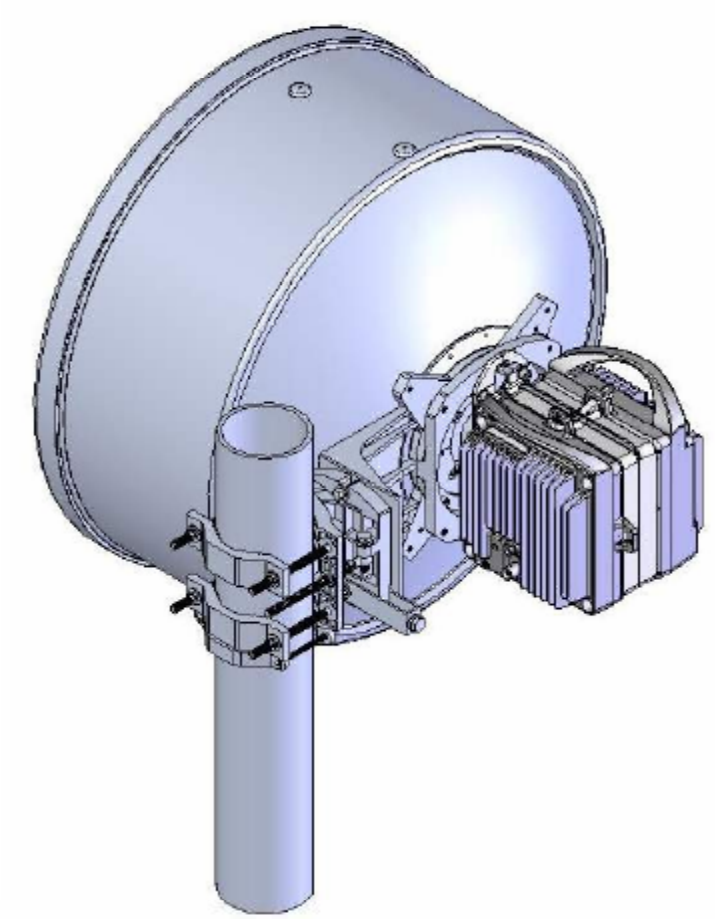
Module Topics

1. Physical installation requirements
2. Installation and Setup
3. Acceptance and commissioning
4. Front panel LEDs

Typical Antenna Mounts



Direct Mount 1+0 configuration



Direct Mount 1+1 configuration

CERAGON networks

IDU & ODU – Physical Location

IDU

- Must be located indoors (-5 C to +45 C)
- Easy accessibility, only by authorized personnel
- -48Vdc Power supply @ 3 Amp (-40.5 to –72 Vdc Power Supply can be used)
- Not more than 300m from outdoor unit location

ODU

- As far as possible from current/future obstacles (trees, buildings)
- Easy accessibility for maintenance
- Good grounding, lightning rod

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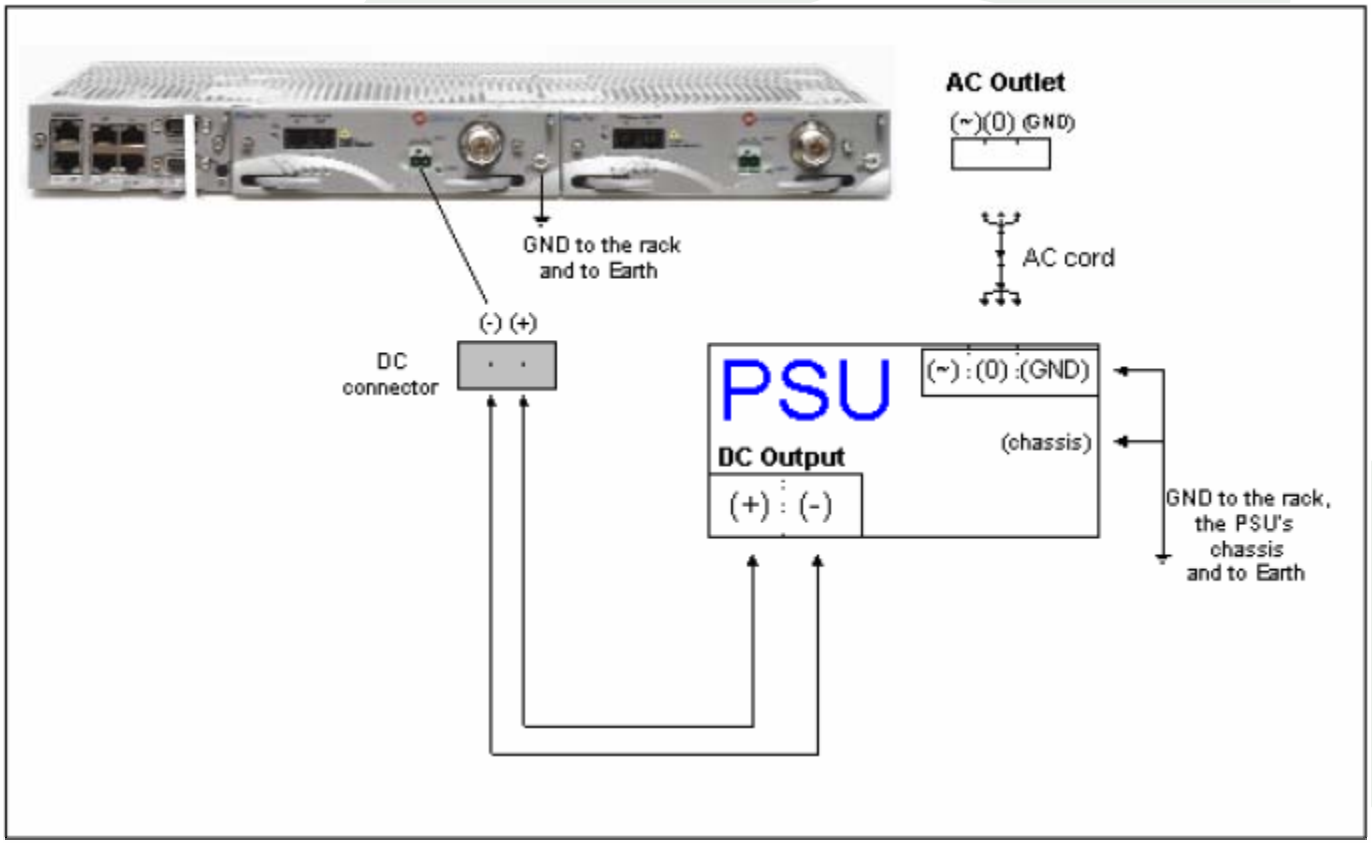
Power Source Connection



CERAGON networks

Coax Cable Selection

- Coax Cable should be used to connect the IDU to the ODU
- Cable should be terminated with ‘N’ type male connectors. Verify inner-pin of connector does not exceed edge of connector
- Cable specifications:

  - max attenuation of 30 dB at 350 MHz
- Recommended:

  - RG-8 (Belden 9914) up to 300m
  - RG-223 up to 100m

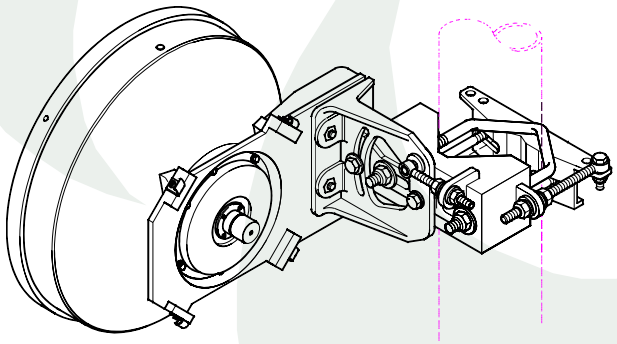
Installation Steps

- Install antenna and ODU on site A
- Install IDU on site A
- Configure the IDU on site A (using Hyper-Terminal)
- Repeat the above on site B
- Align the antennas
- Verify link operation & performance

CERAGON networks

Antenna Installation

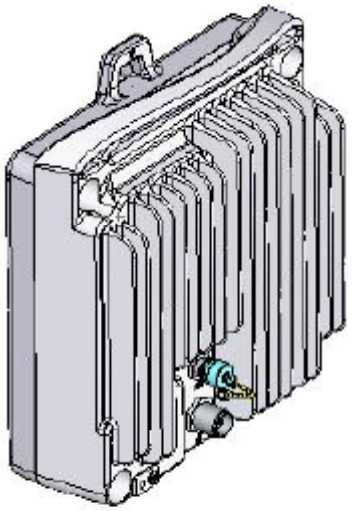
- Install antenna on pole according to attached instructions
- Verify secure installation
- Aim antenna to other end of the link
- Use telescope or compass for rough alignment if necessary



CERAGON networks

ODU Installation

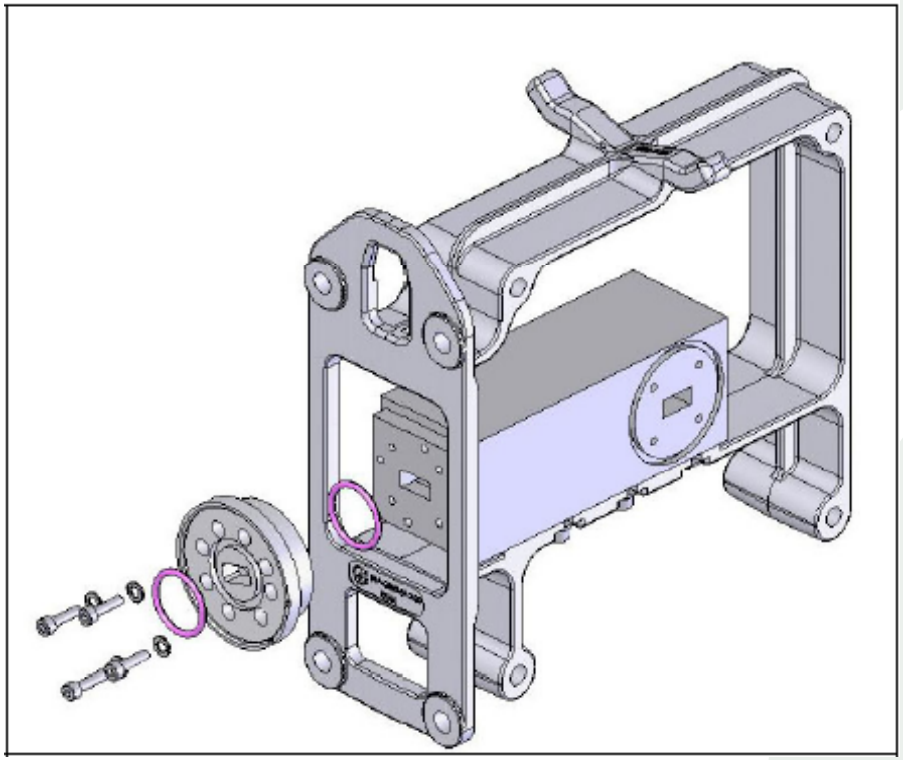
- Connect ODU to the Antenna/Soram, using 4 Screws
- Connect IF coax cable to ODU. Tight connector by hand (no tools!)
- 'N' type Connectors should be waterproofed and sealed
- Connect ODU earth point to suitable rooftop earth
- Verify correct polarization
  - Handle on top – Vertical polarization
  - Handle on the side – Horizontal polarization



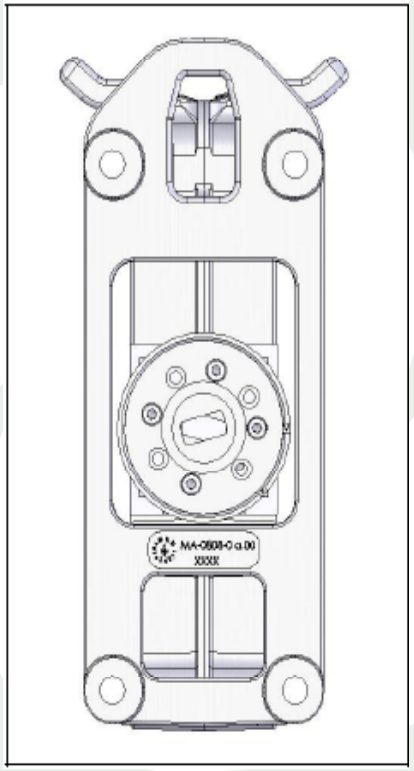
RFU-C

CERAGON networks

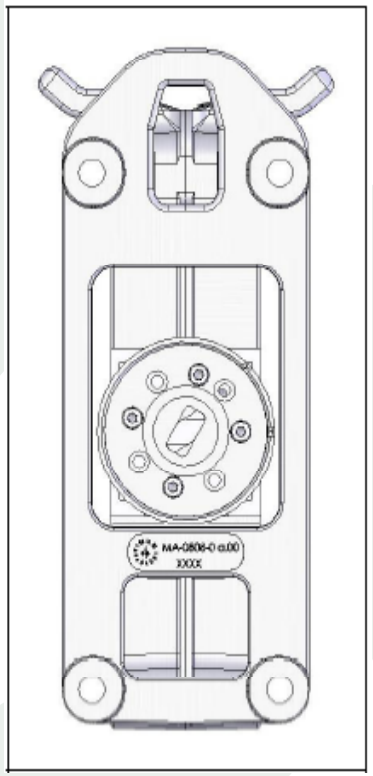
1500R 1+1 Components



Coupler for 1+1 HSB config

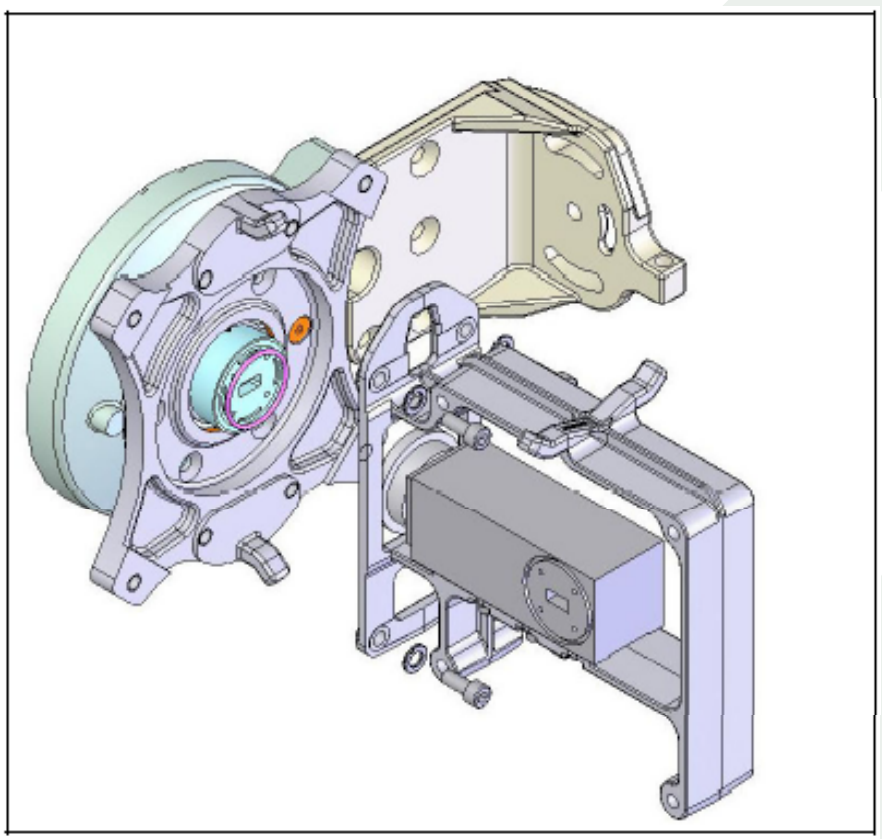


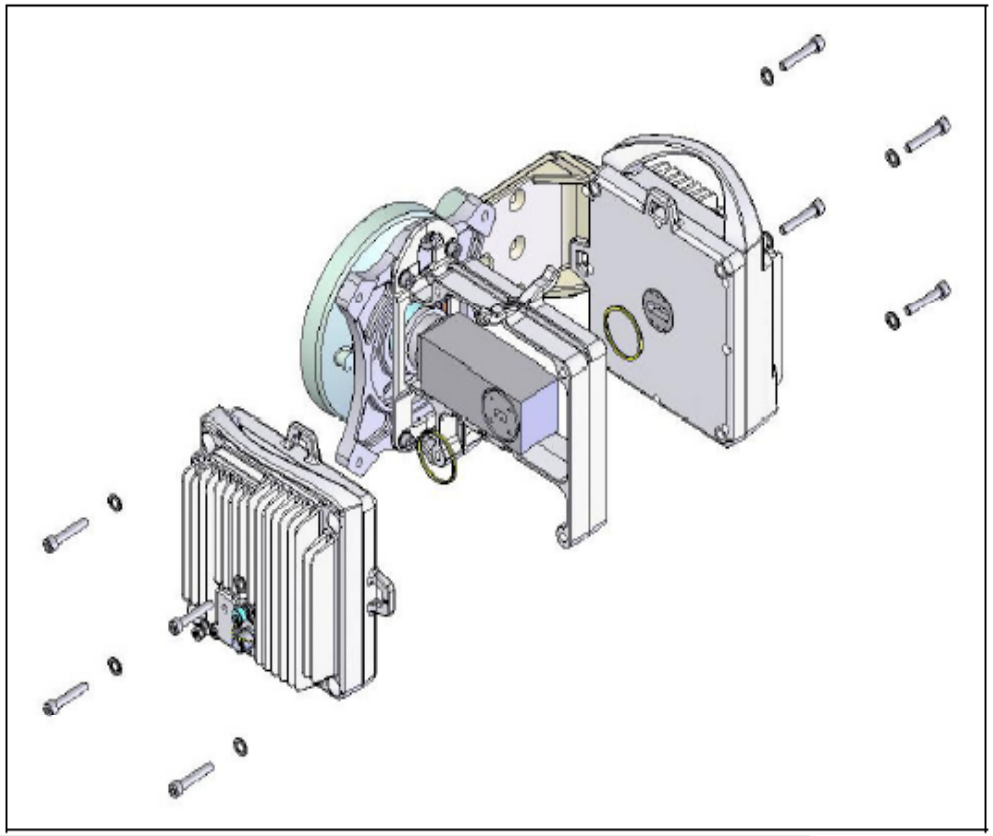
Vertical
Polarization



Horizontal
Polarization

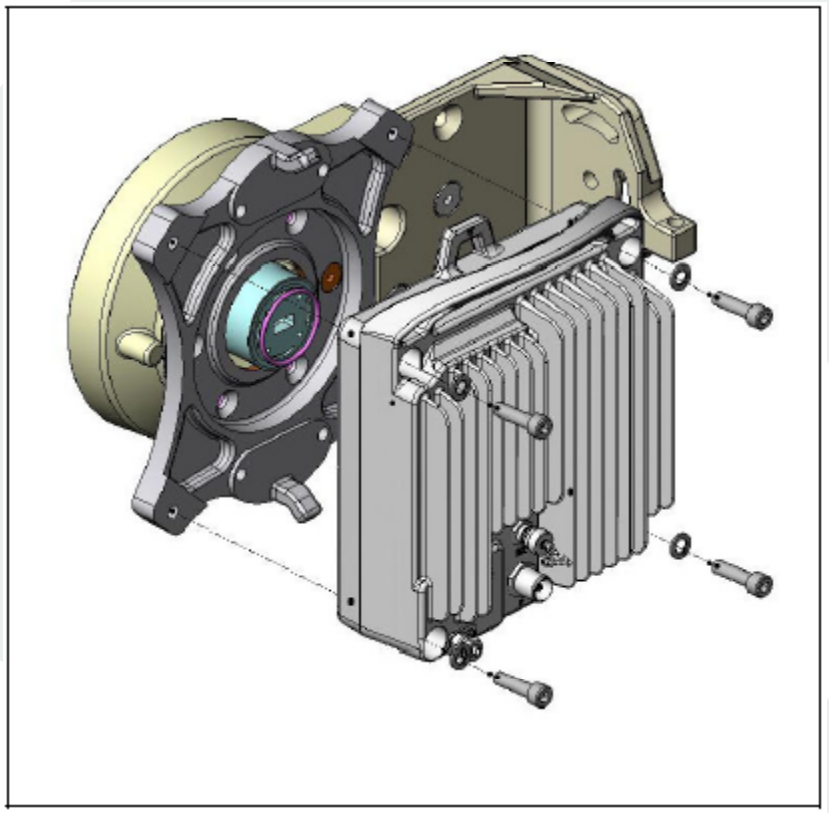
Direct Mount - Ceragon interface 1+1





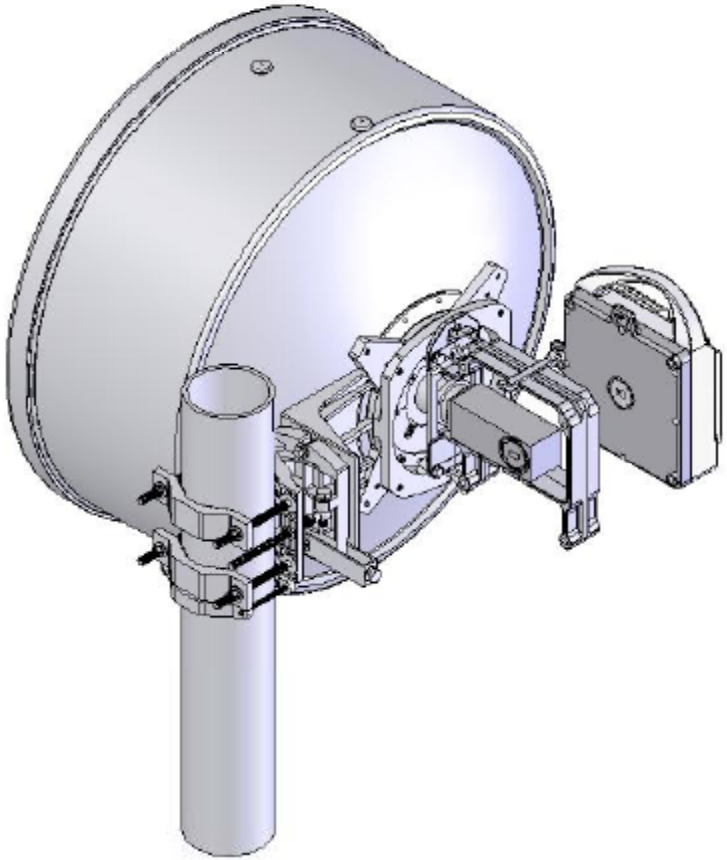
HSB 1+1 Direct Antenna mount configuration

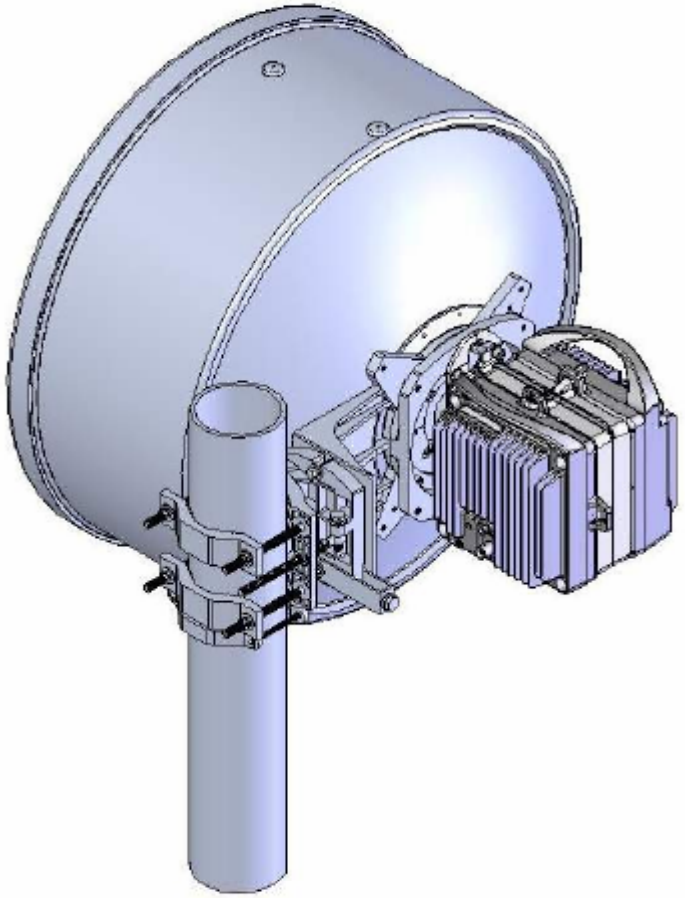
1500R Direct mount - Ceragon interface 1+0



1+0 Direct mount interface

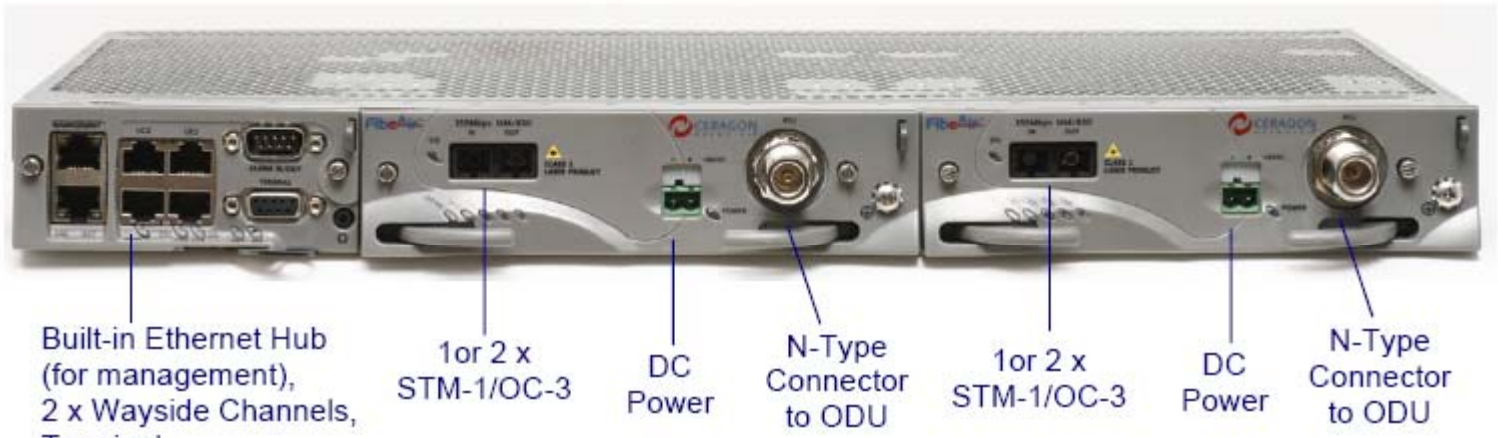
HSB 1+1 Direct Mount with Antenna



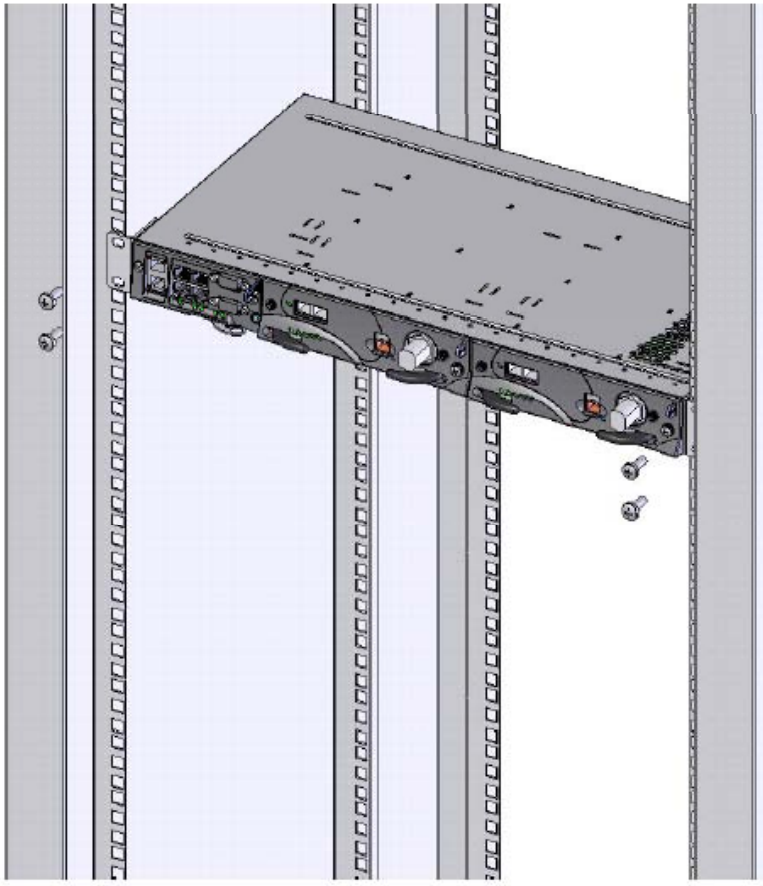


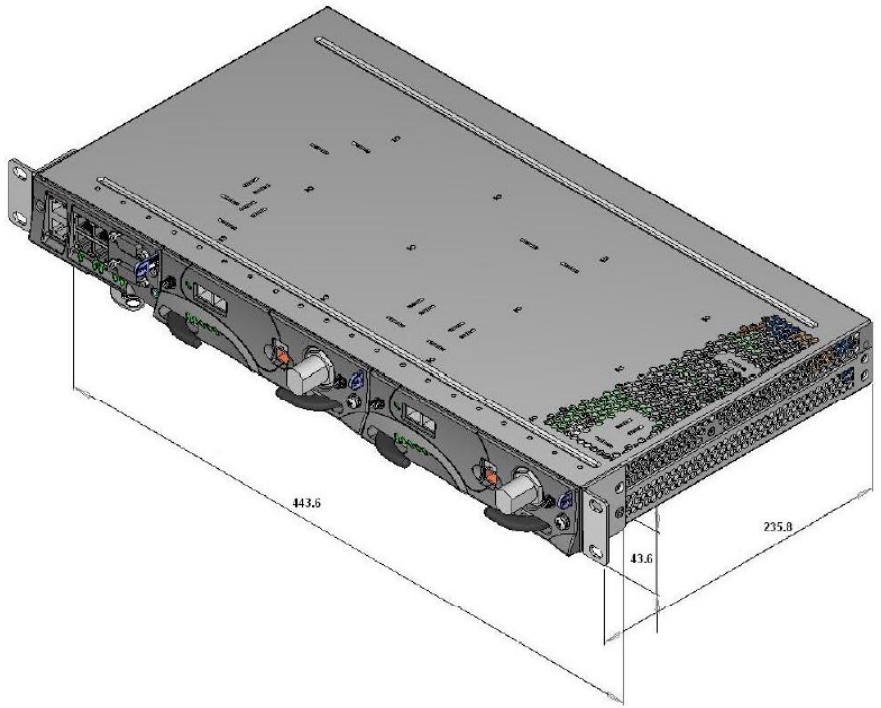
IDU Installation

- Install IDU in rack/cabinet
- 19” and 21” mounting brackets provided with IDU
- Connect IF cable to the IDU
- Tight connector by hand only (no tools!)
- Connect IDU grounding point to clean station earth.
- Connect –48Vdc to IDU



Installation Pics





IF Cable

CERAGON networks

Configuring Management

FibeAir 1500R

Agenda

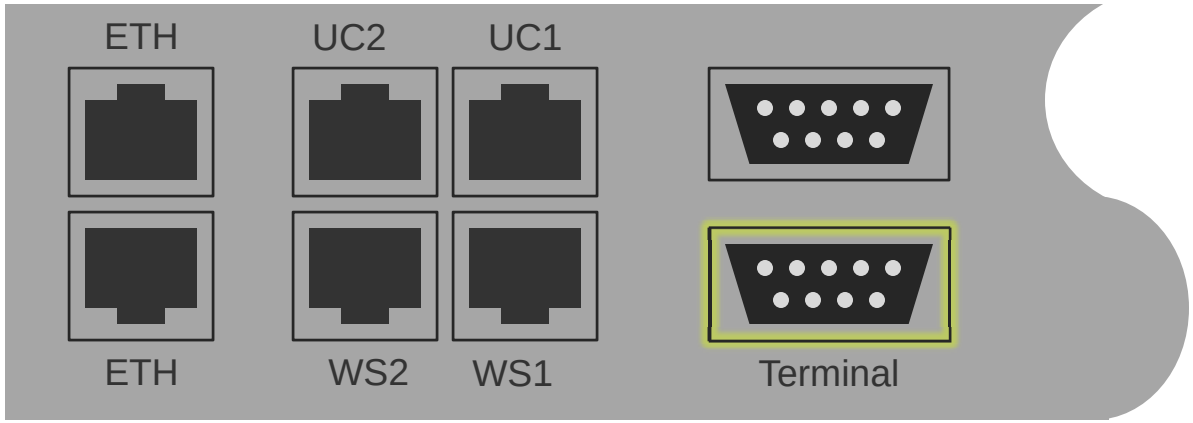
- Accessing the IDU
- Setting the IP address
- Setting up a connection
- Launching CeraView
- Management via main window
- GUI configuration
- GUI configuration for out-of-band via WSC
- GUI configuration for In band
- GUI configuration for In band: DCCR
- GUI configuration for In band: DCCR + DCCM
- GUI configuration for In band: DCCR + Media Specific
- GUI configuration for In band: DCCR + PPPoE
- GUI configuration for Wayside Channel
- Setting Network ID
- Calculating Subnet Mask

CERAGON

Accessing the IDU

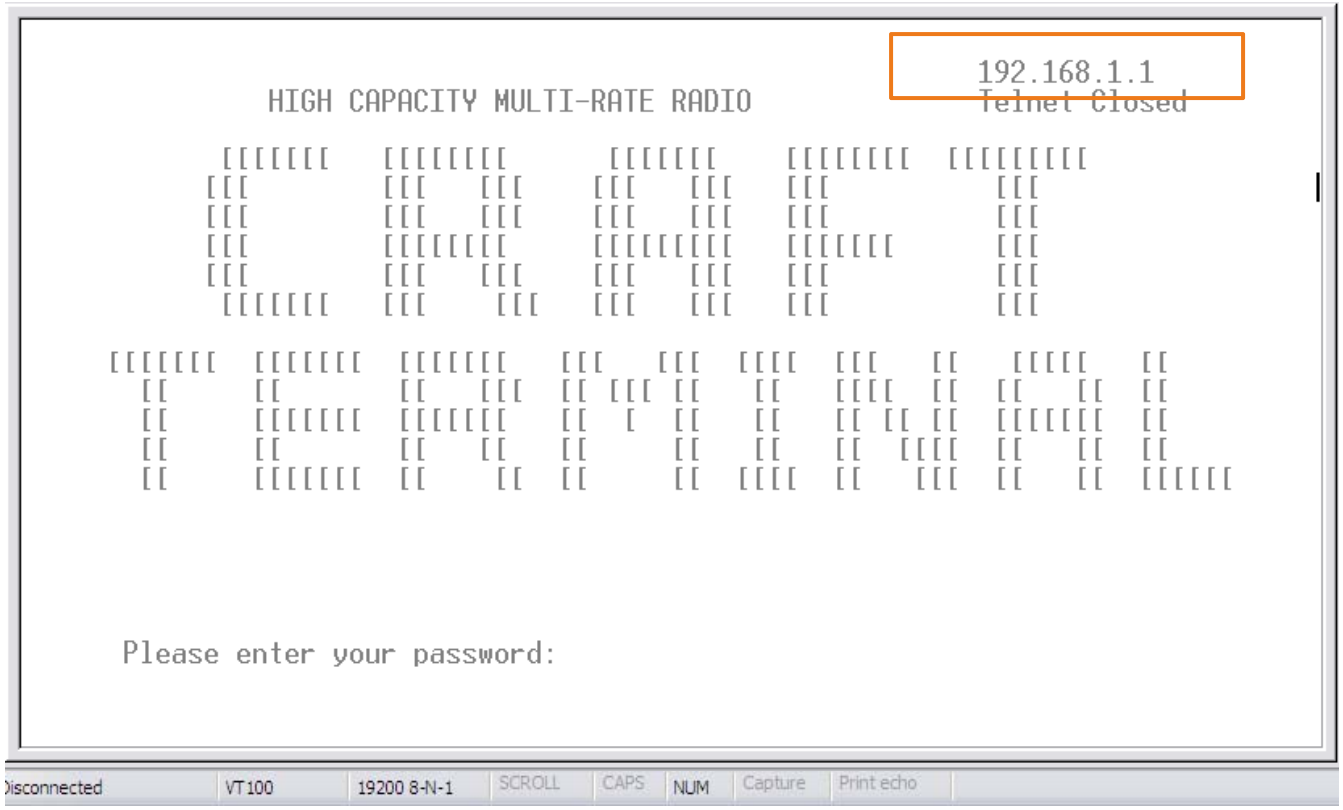
- Connect your working station to the IDU where it says Terminal
- Launch Hyper-Terminal or similar (TeraTerm / Putty) with the following settings:

Baud	19200
Data bits	8
Parity	None
Stop Bits	1
Flow control	None
Emulation	VT100



Accessing the IDU

Once you are logged in successfully, you should be able to see the following:



As one can see, There is no need to log in to show the IDU's IP

Write down the IDU's IP and proceed to next slide

Setting an IP address

Type “admin” for Password

A new screen will show:

```
\Main Menu
SUPER USER                  Interface: None                    192.168.1.1
                  HIGH CAPACITY MULTI-RATE RADIO               Telnet Closed

      Main Menu
     -----------

  Q     Quit                                  B     Back

  1    +Configuration
  2    +System Status
  3    +Maintenance
  4    +Diagnostics
  5    +Logs




Select:

 -
```

Type “B” to go back

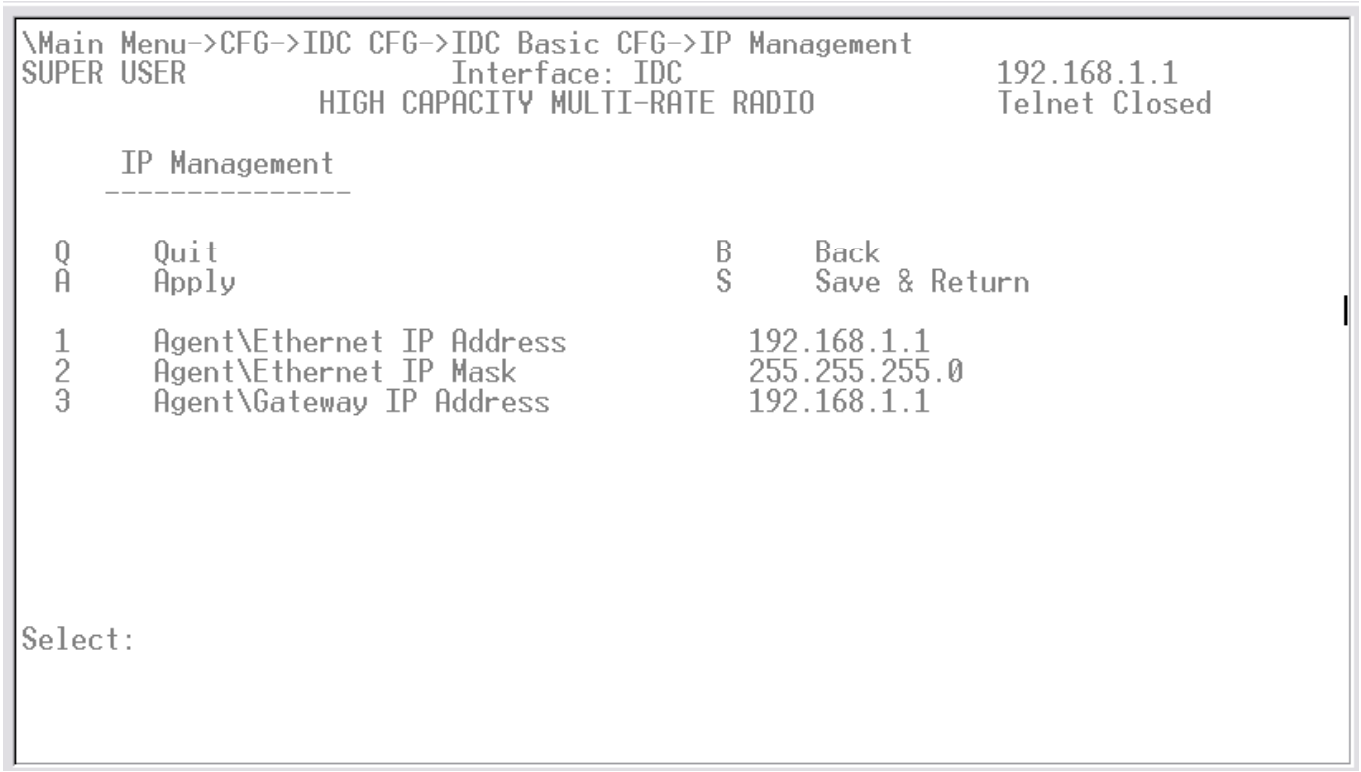
Type “Q” to quit

CERAGON

Setting an IP address

Using the menu, click “1” four times until you get the following screen:

(Your location in the menu is also displayed in the most upper side of the screen)



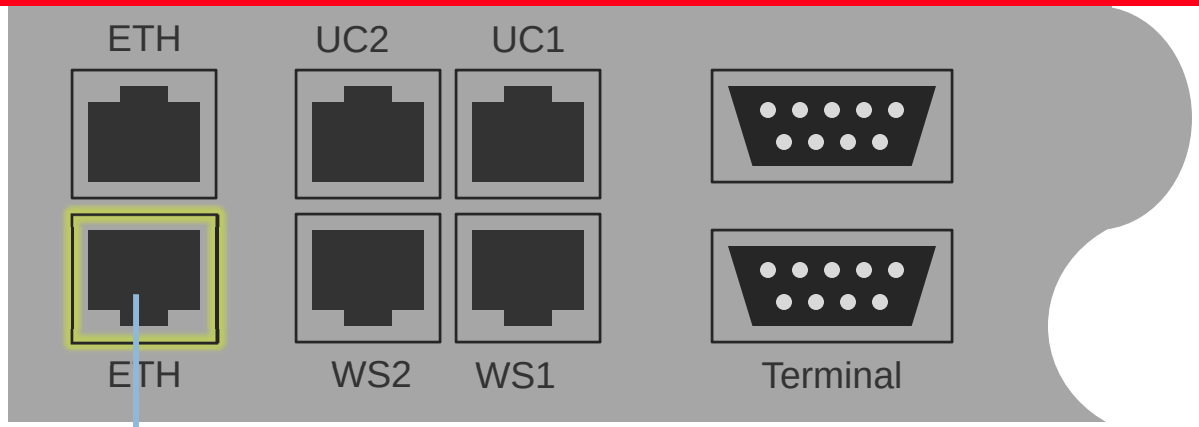
Setting an IP address

- Set the IP address for the IDU (Agent/Ethernet IP)
- Set the Subnet mask (for PC to IDU connection use 255.255.255.0)
- GW address should be defined when the NE is connected via Switch/Router, otherwise (PC-to-IDU) set the GW to 0.0.0.0
- GW address should be set to IP address out of the RING's range

```
\Main Menu->CFG->IDC CFG->IDC Basic CFG->IP Management
SUPER USER                  Interface: IDC                    192.168.1.1
                  HIGH CAPACITY MULTI-RATE RADIO              Telnet Closed

      IP Management
     ---------------

   Q     Quit                                  B     Back
   A     Apply                                 S     Save & Return

   1     Agent\Ethernet IP Address               192.168.1.10
   2     Agent\Ethernet IP Mask                  255.255.255.0
   3     Agent\Gateway IP Address                0.0.0.0
```


CERAGON

Setting up a connection



Connect your laptop to the IDU

Make sure your laptop is within the same subnet

IDU: 192.168.1.10**/255.255.255.0**
PC: 192.168.1.100**/255.255.255.0**

Reset the IDC (soft reset)

PING IDU to verify connection is up

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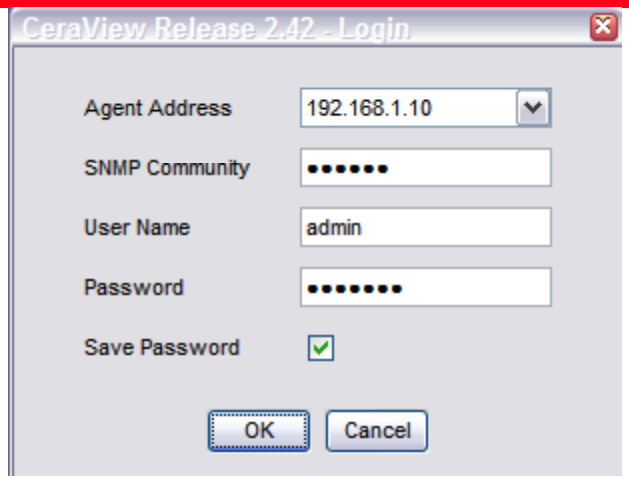
Launching CeraView



Launch CeraView installed on your working station

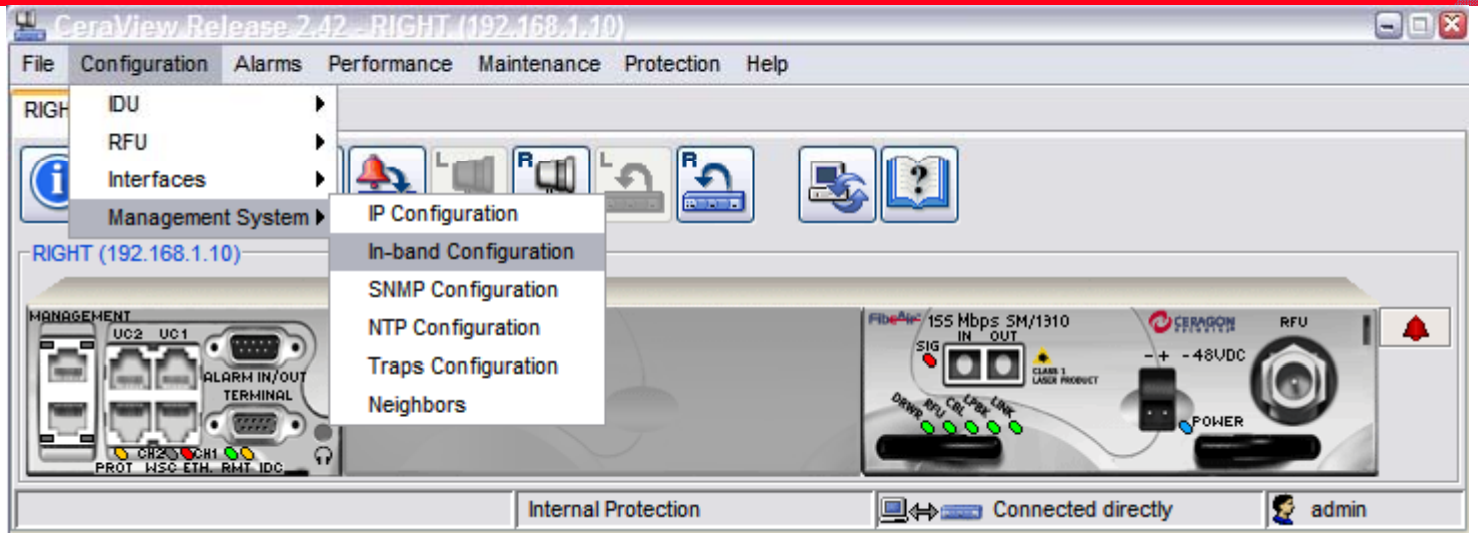
Make sure IP is set correctly

Use “admin” for user name

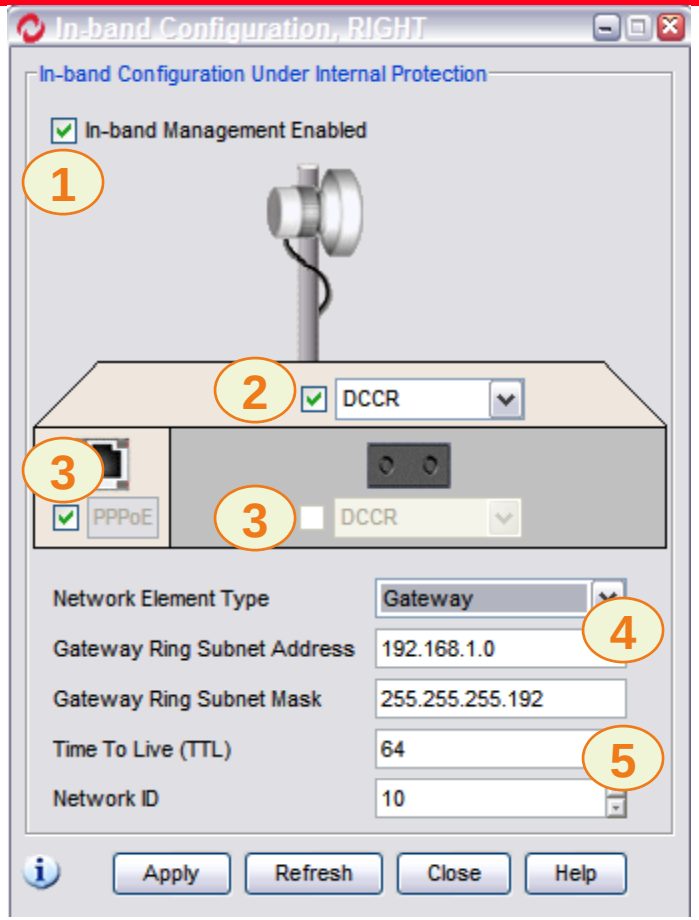
Use “ceragon” for Password

CERAGON

Management via main window



GUI configuration



1) For In-band management, enable the In-band check-box

2) MNG channel on the radio and may be configured as:

- DCCR (192Kbps)
- DCCM (572Kbps)
- Media Specific (64Kbps)
- Proprietary (192Kbps)

3) MNG channel on the line and may be configured as:

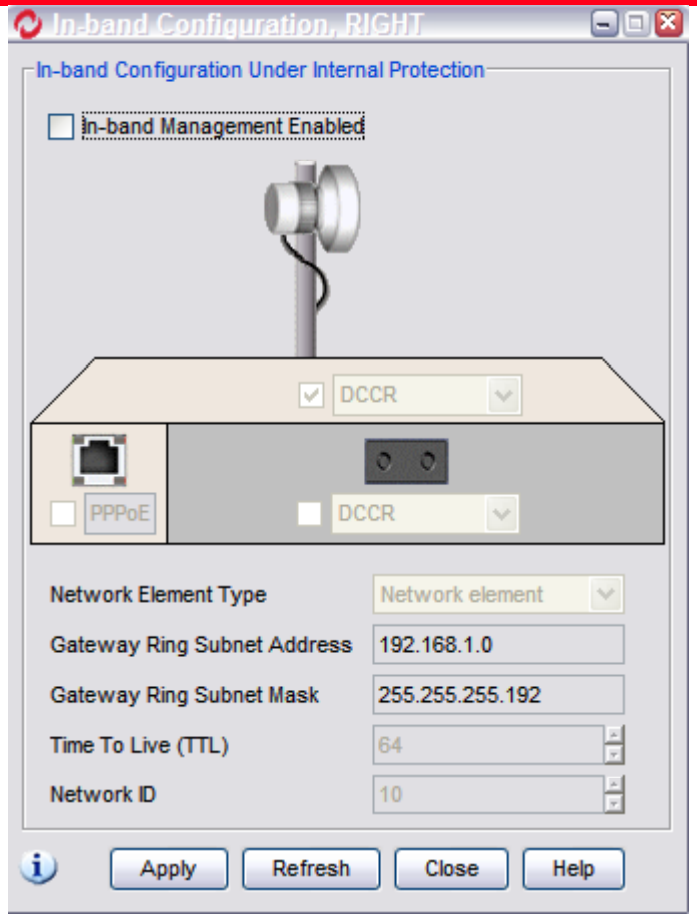
- DCCR (192Kbps)
- DCCM (572Kbps)
- Media Specific (64Kbps)
- PPPoE

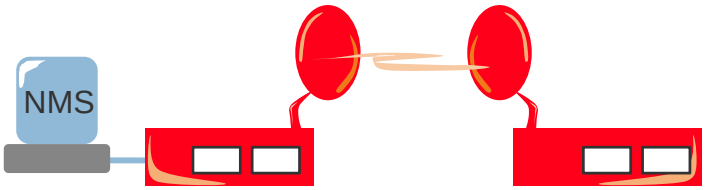
4) The IDU connected to the NMS should be configured as the **Gateway** (there should be one GW in the network). All other IDUs are configured as Network Elements

5) **TTL** – Time To Live – maximum number of hops that a packet can travel before it is discarded

Network ID – make sure you set a unique value per radio link

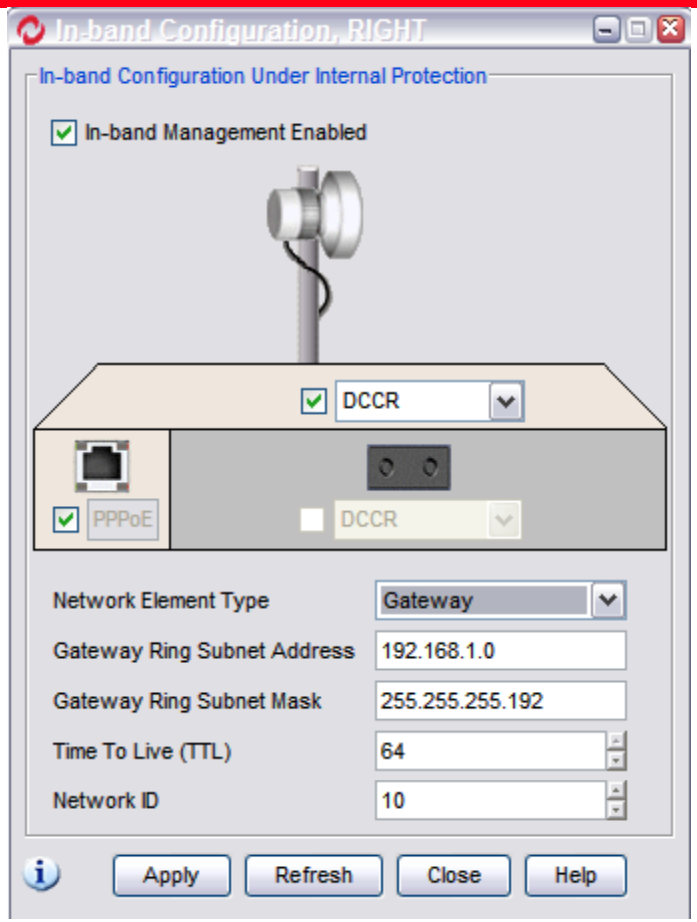
GUI configuration for OOB

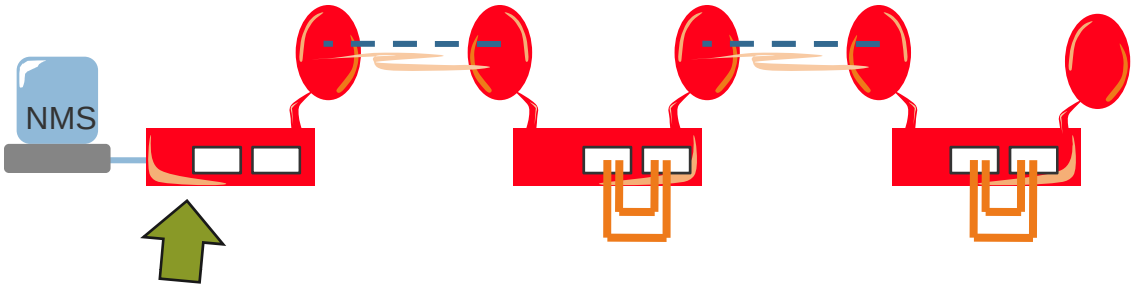




For Out of band management disable the In-band check-box

GUI configuration for In band





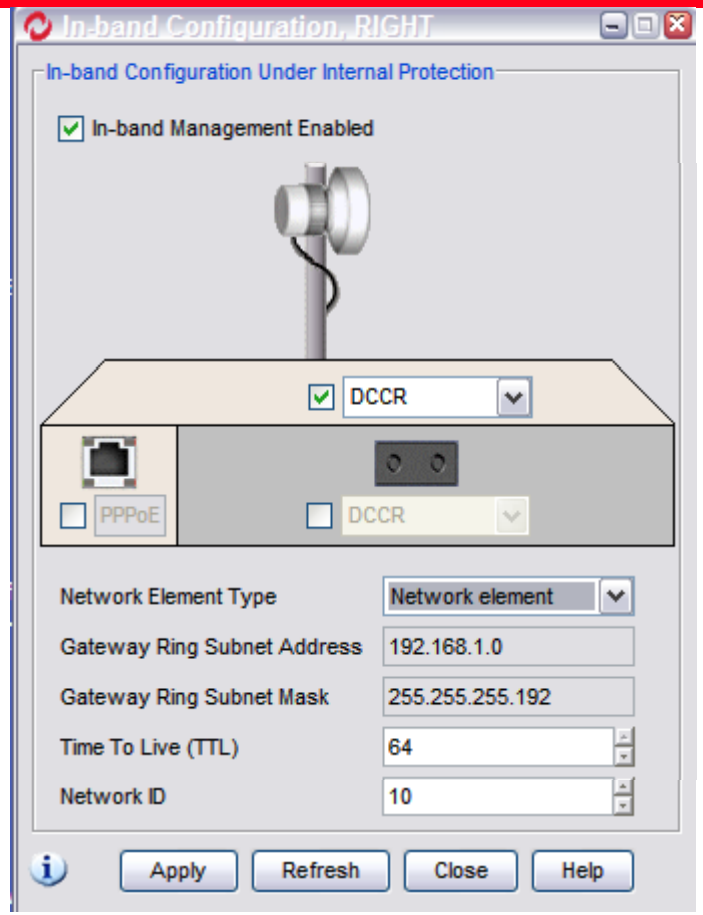
In-band is enabled

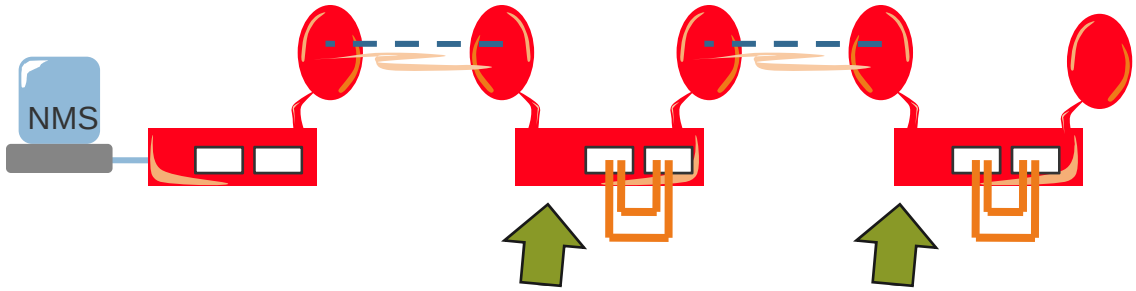
The IDU connected to the NMS is configured as a GW

PPPoE is selected to enable MNG encapsulation over the SDH frame (radio)

CERAGON

GUI configuration for In band: DCCR





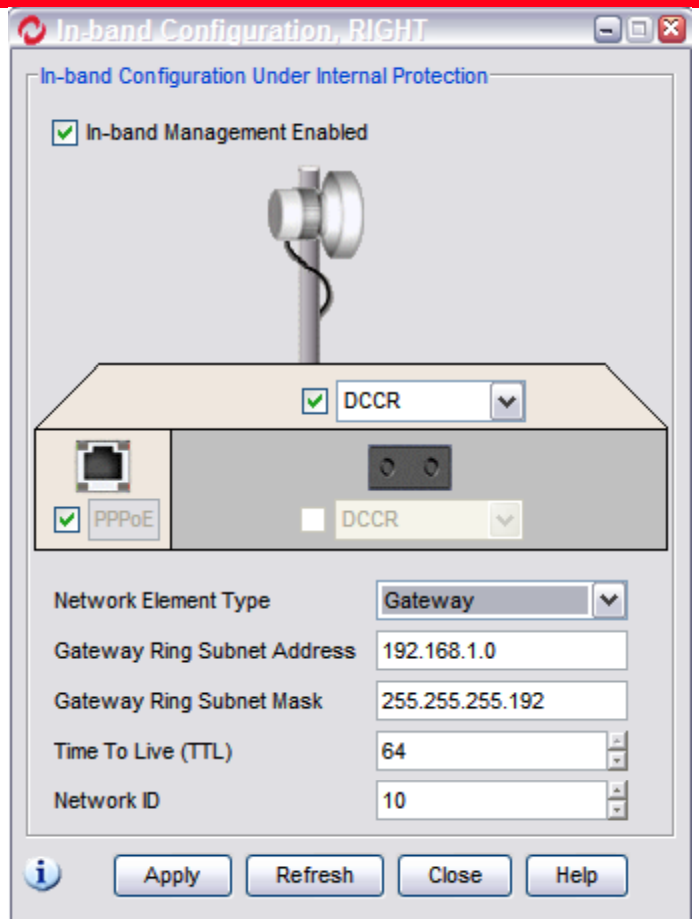
Cascaded IDUs are considered as Network Elements

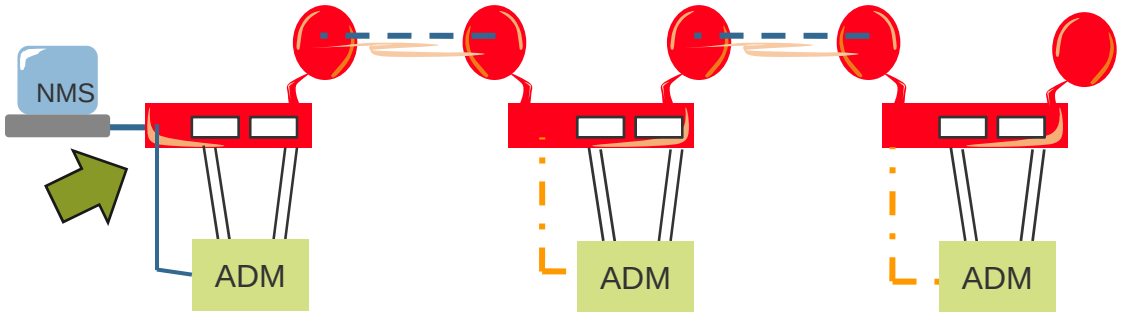
For each NE, follow the attached example

Make sure you set unique Network ID per Network

CERAGON

GUI configuration for In band: DCCR + PPPoE





IDU connected to NMS is configured as the GW

First ADM is connected to ETH port of IDU

Therefore, we configure PPPoE to manage the ADM via the ETH port

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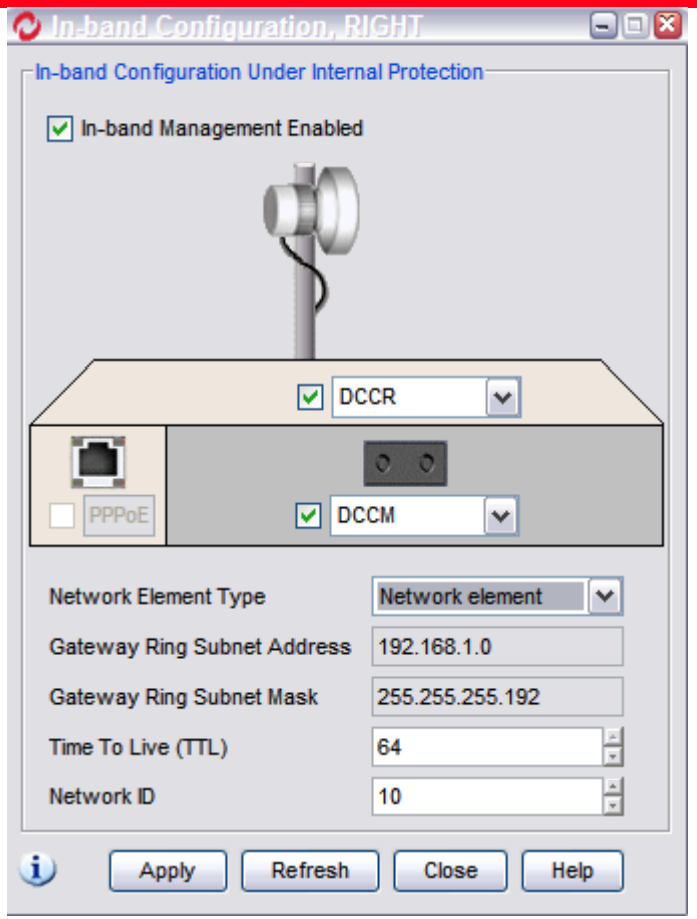
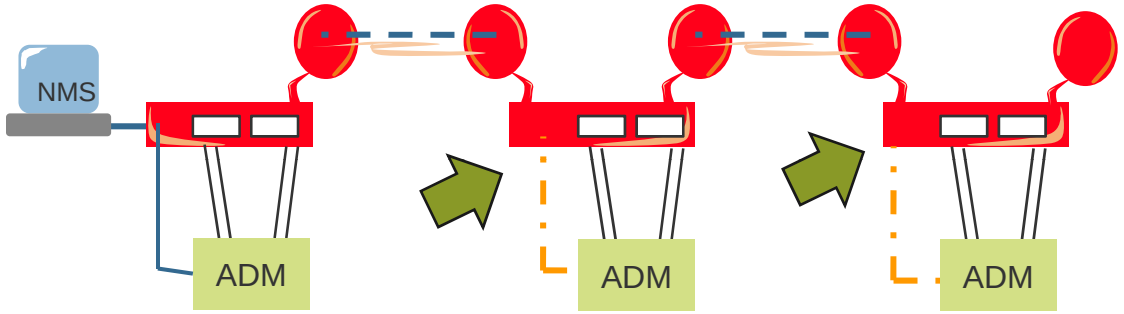
GUI configuration for In band: DCCR + DCCM





Cascaded IDUs are configures as NEs

Cascaded IDUs are managed via DCCR channel

Cascaded ADMs are managed via DCCM channel

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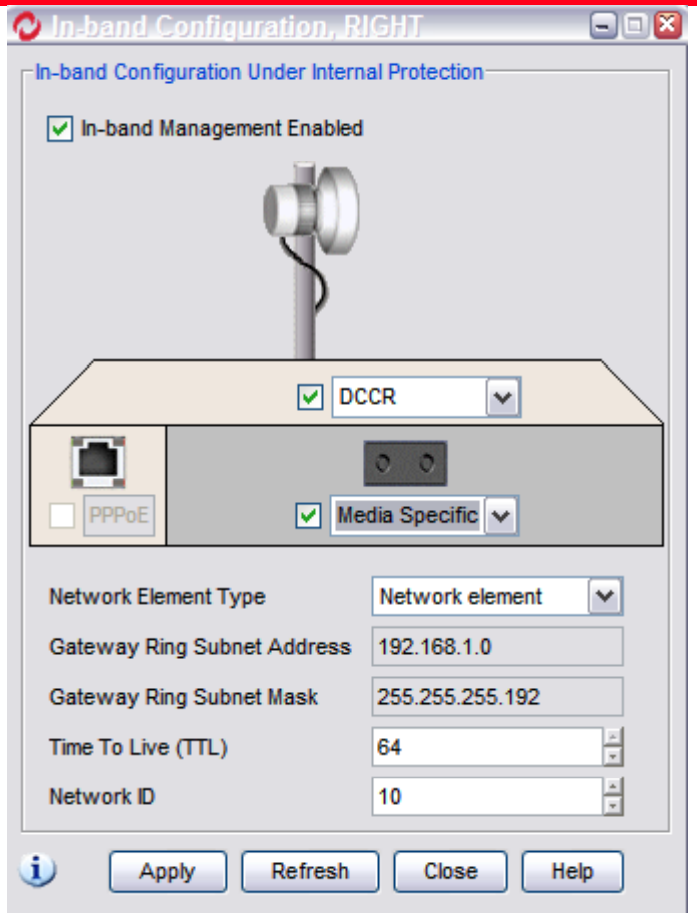
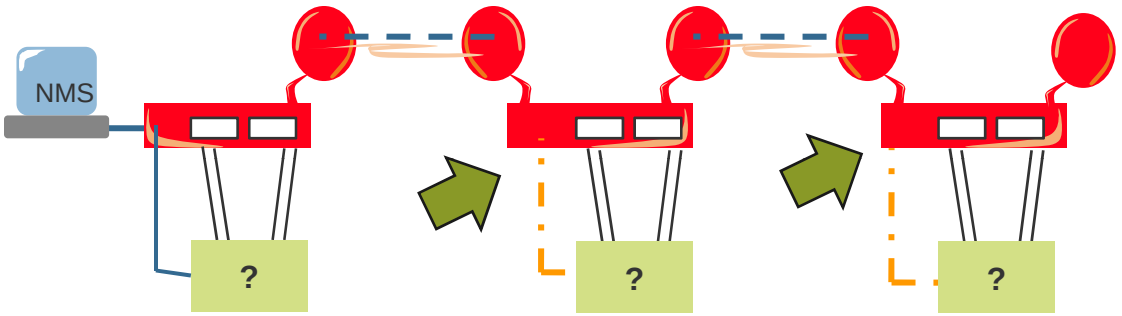
GUI configuration for In band: DCCR + M.S.





When we need to manage 3rd party devices, we may use the Media Specific channel

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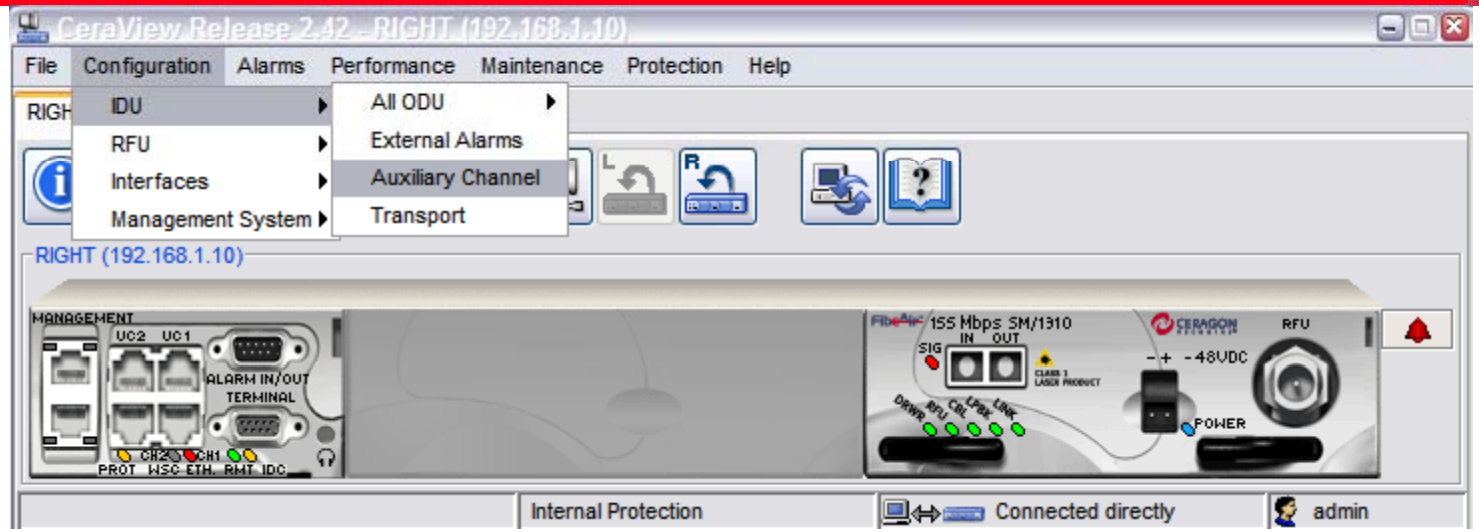
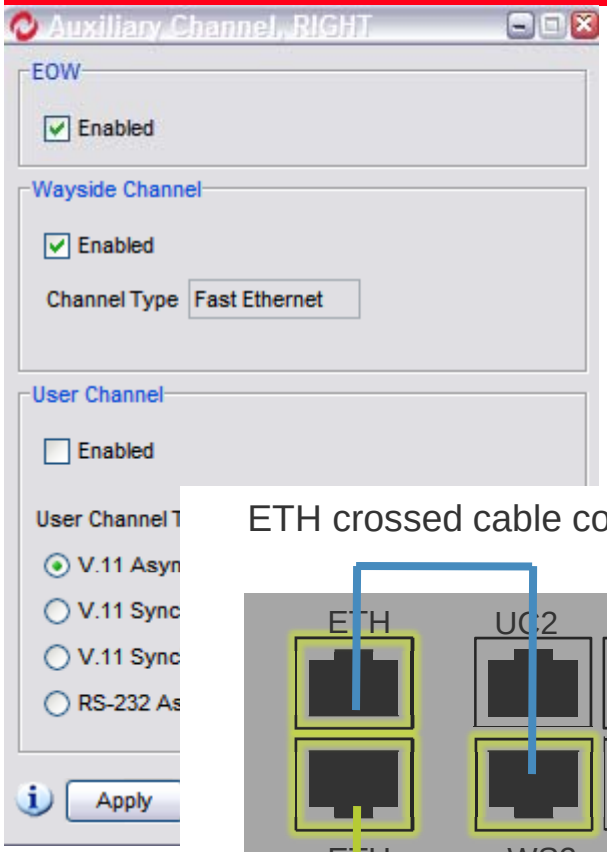
GUI configuration for WSC

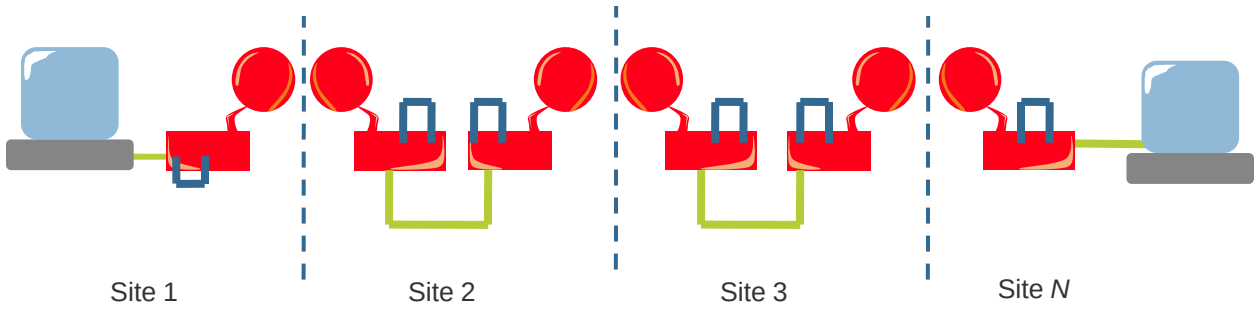


Access WSC configuration as explained in the GUI example above

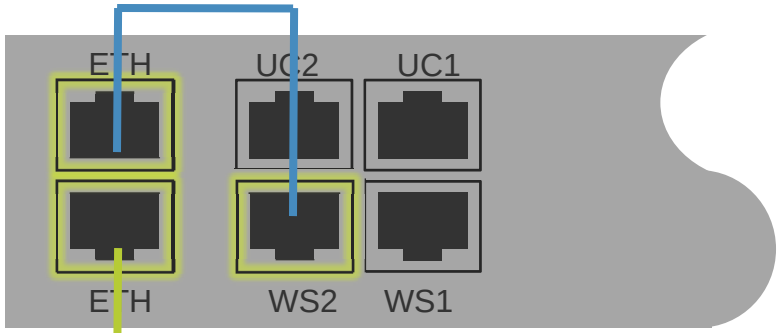
(Menu / Configuration / AUX Channel)

GUI configuration for WSC





ETH crossed cable connects ETH port to WSC port



Enable WSC on all IDUs

ETH crossed cable connects 2 IDUs in the same site (ETH to ETH ports)

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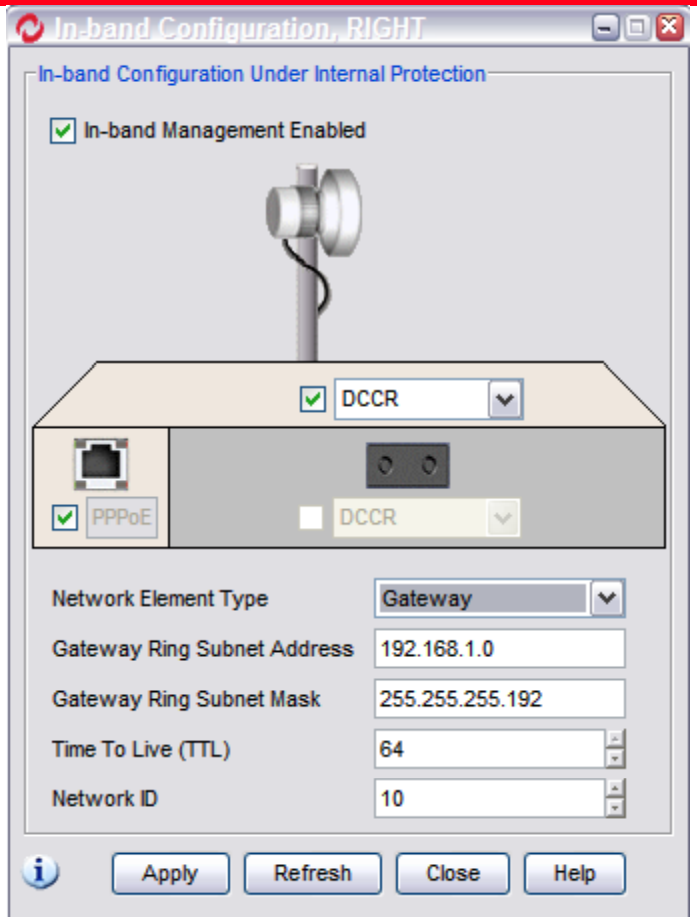
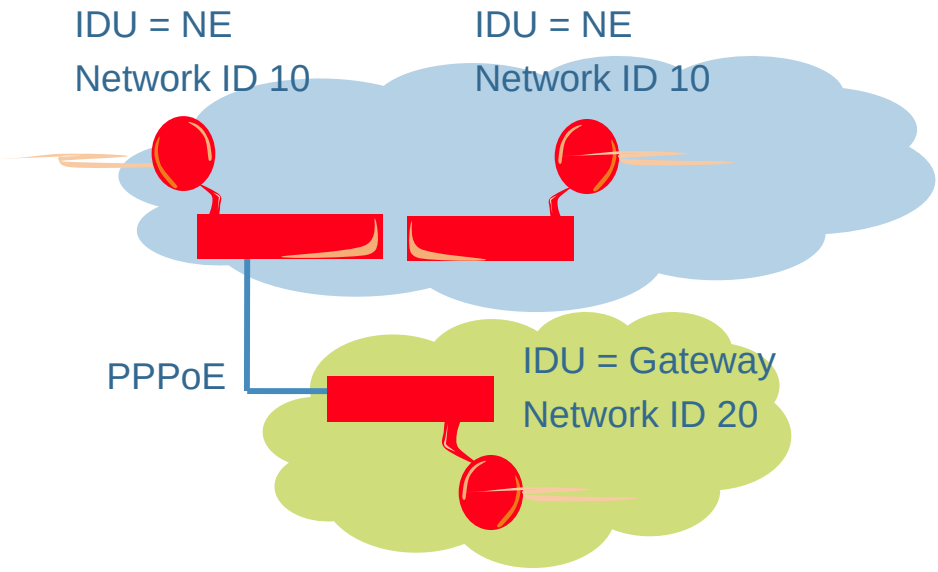
Setting Network ID



The Network ID is relevant for SPUR constellation

It is has to be unique for Point to Point radio link



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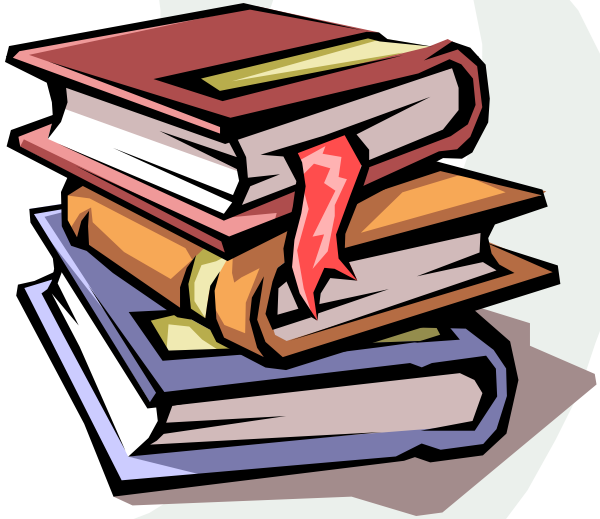
Maintenance and Troubleshooting

Module Overview

- Module consists of presentation
- Module covers the Maintenance Procedures
  - Software upgrade procedure
  - Unit replacement procedure



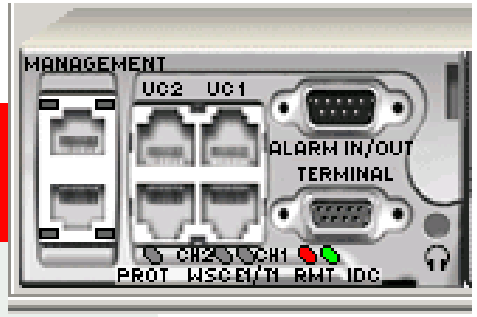
CERAGON networks

LEDs Display

Main Window for FibeAir 1500R

- LED display for IDC
- LED display for right drawer
- LED display for left drawer (if exists)

IDC LEDs (1)



- **CH1/CH2 Wayside**
  - <**green**> valid E1/T1 signal (or Ethernet)
  - <**red**> LOS on E1/T1 input (or no Ethernet signal)
  - <**off**> E1/T1 (or Ethernet) disabled, not supported in HW
- **Management (Ethernet NMS port)**
  - <**green**> valid Ethernet signal (blinking-activity)
  - <**off**> no Ethernet signal,disabled, not supported in HW
- **IDC**
  - <**green**> IDC ok
  - <**yellow**> fan failure, configuration/firmware mismatch
  - <**red**> HW failure (load correct file or replace IDC)
- **RMT**
  - <**green**> communication to remote ok, no alarms on remote
  - <**yellow**> minor alarm on remote
  - <**red**> remote communication failure, major alarm on remote

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IDC LEDs (2)

- **PROT** 1+1 protection
  - <**green**> protection cable OK
  - <**yellow**> protection lockout, forced switch
  - <**red**> protection cable failure (no cable, errors on the cable)
  - <**off**> protection disabled, not supported in HW

Drawer LEDs .

- **DRWR** <**green**> drawer ok
  <**yellow**> drawer in standby mode (doesn't transmit in 1+1 mode)
  <**red**> drawer HW failure, missing FW/Configuration files, configuration mismatch
- **RFU** <**green**> ODU ok
  <**yellow**> Rx level out of range (low RSL), Tx level out of range (ODU Tx failure)
  <**red**> ODU fail due to power or unlocked synthesizers
- **CBL** <**green**> cable ok
  <**red**> cable open, cable short, cable swap
- **LPBK** <**green**> loopback not active
  <**red**> loopback active
- **LINK** <**green**> radio link ok
  <**yellow**> Signal Degrade alarm (minor BER alarm) on radio side
  <**red**> Loss Of Frame, EXC alarm (major BER alarm) on radio side

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STM-1 Line LEDs

- **SIG**
  - <**green**> STM-1 line input ok
  - <**yellow**> SD (Signal Degrade) alarm (minor BER alarm) on line side
  - <**red**> LOS (Loss Of Signal), LOF (Loss Of Frame), EXC (Excessive Errors) alarm (major BER alarm) on line side

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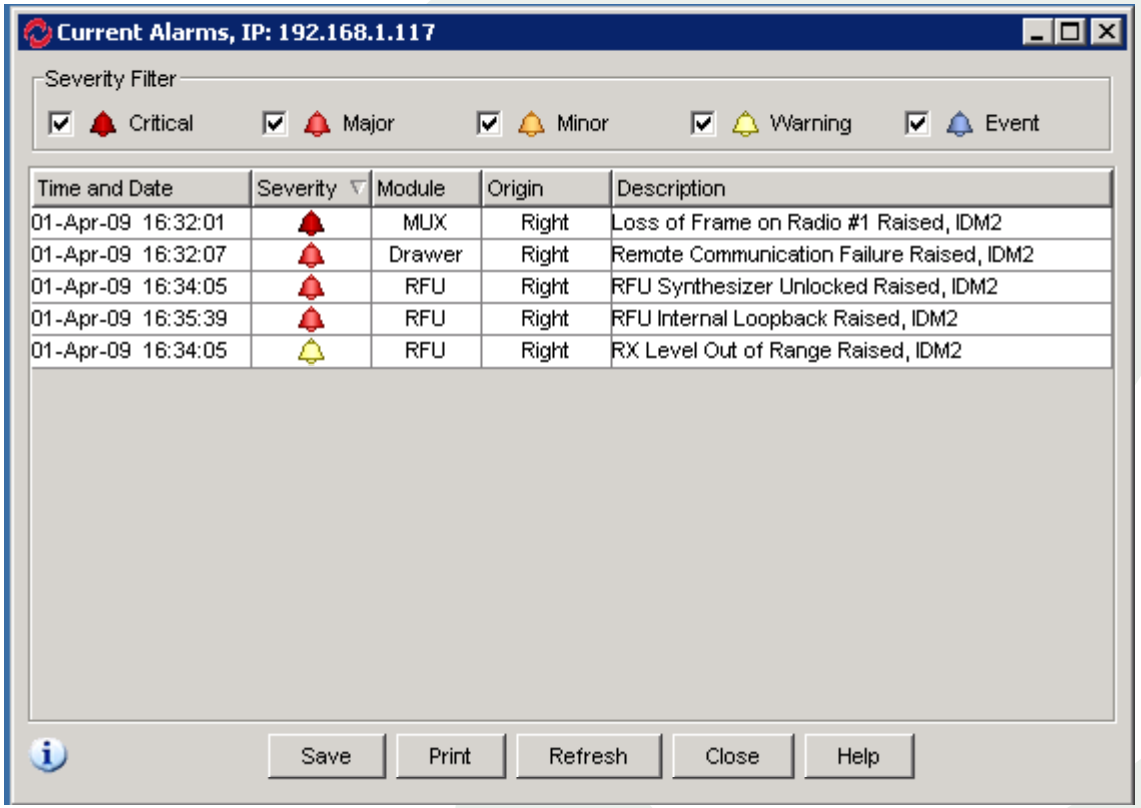
Troubleshooting Tools

- Alarm log
- Configuration report
- Receive Signal Level PM
- Radio SDH PM
- STM-1 Line SDH PM
- Loop backs

Current Alarms



- Currently active alarms with severity and source
- Display alarms for Right and Left drawers
- IDU and ODU temperature reading

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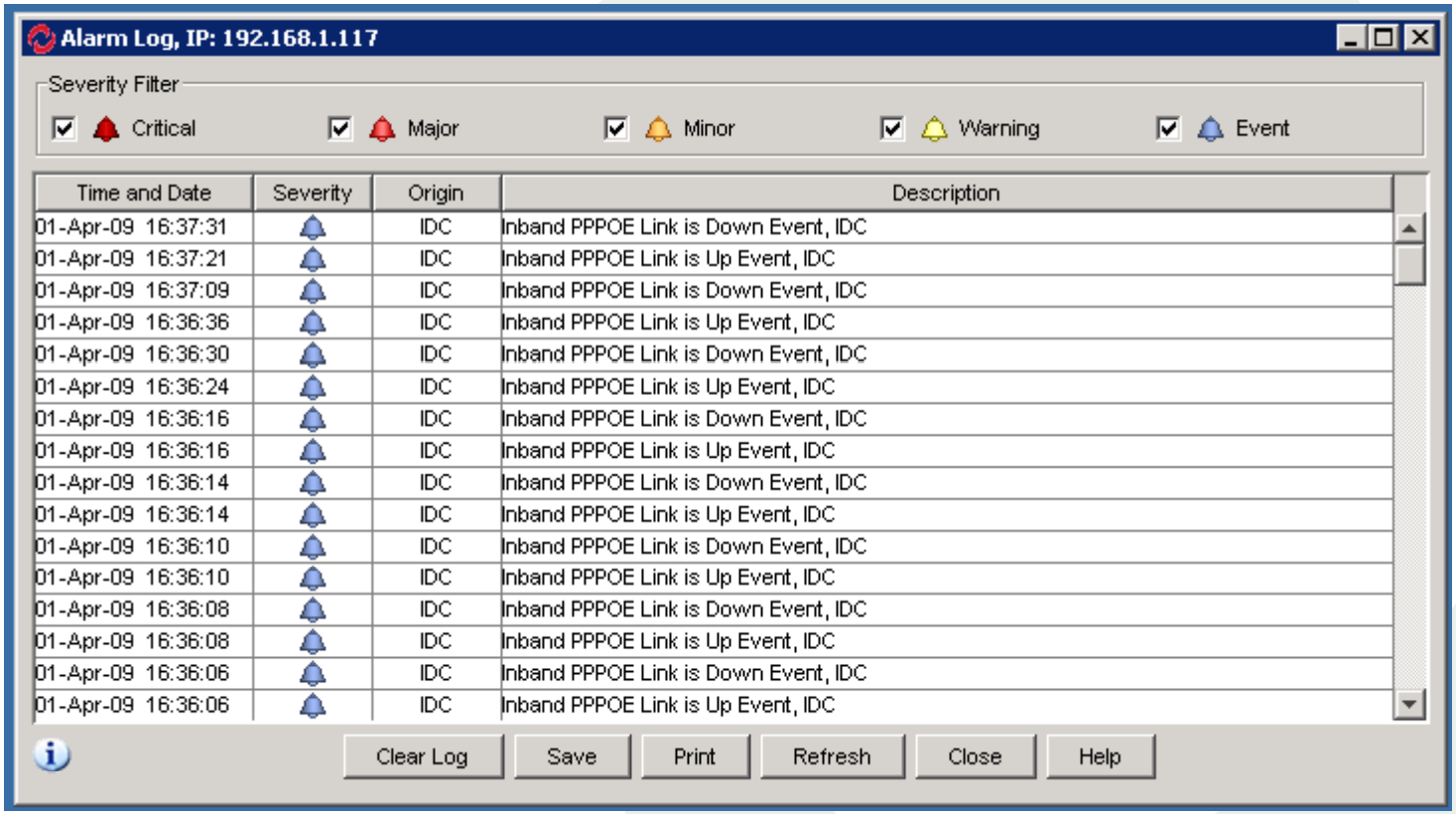
Alarm Log



- Time and date of alarms, severity and origin (what drawer)
- Severity-based filters
- Up to 100 log entries with automatic save
- Log can be saved and exported to Notepad, Word, Excel…

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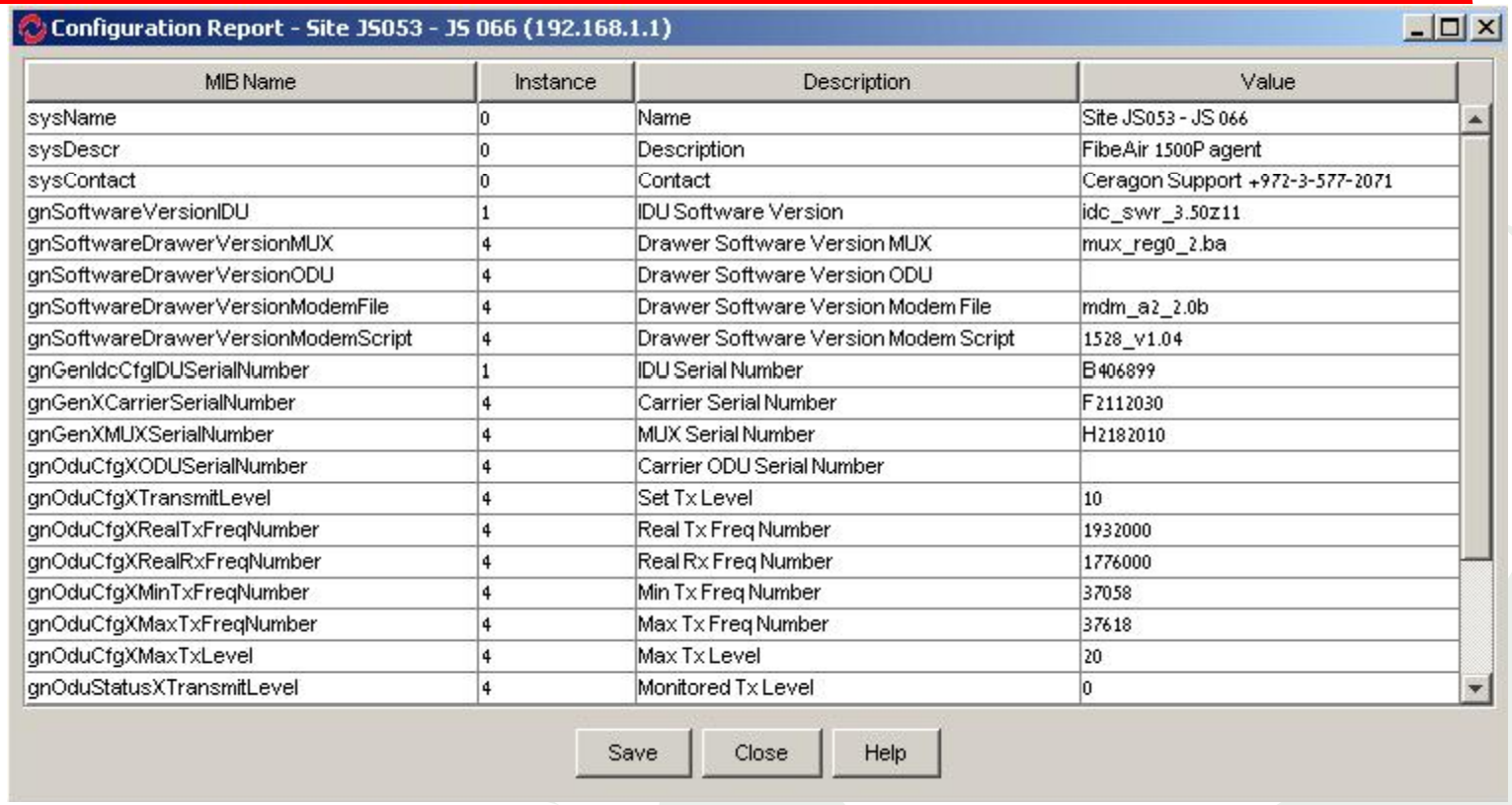
Troubleshooting Using Alarm Log

- Check current alarm (!!!)
- Identify when alarms started
- Identify separate events based on time
- Check correlation with other links failed
- Check correlation to RSL to explain alarms
- Check correlation to Radio/Line SDH PM

Configuration Report



MIB Name	Instance	Description	Value
sysName	0	Name	Site JS053 - JS 066
sysDescr	0	Description	FibeAir 1500P agent
sysContact	0	Contact	Ceragon Support +972-3-577-2071
gnSoftwareVersionIDU	1	IDU Software Version	idc_swr_3.50z11
gnSoftwareDrawerVersionMUX	4	Drawer Software Version MUX	mux_reg0_2.ba
gnSoftwareDrawerVersionODU	4	Drawer Software Version ODU	
gnSoftwareDrawerVersionModemFile	4	Drawer Software Version Modem File	mdm_a2_2.0b
gnSoftwareDrawerVersionModemScript	4	Drawer Software Version Modem Script	1528_v1.04
gnGenIdcCfgIDUSerialNumber	1	IDU Serial Number	B406899
gnGenXCarrierSerialNumber	4	Carrier Serial Number	F2112030
gnGenXMUXSerialNumber	4	MUX Serial Number	H2182010
gnOduCfgXODUSerialNumber	4	Carrier ODU Serial Number	
gnOduCfgXTransmitLevel	4	Set Tx Level	10
gnOduCfgXRealTxFreqNumber	4	Real Tx Freq Number	1932000
gnOduCfgXRealRxFreqNumber	4	Real Rx Freq Number	1776000
gnOduCfgXMinTxFreqNumber	4	Min Tx Freq Number	37058
gnOduCfgXMaxTxFreqNumber	4	Max Tx Freq Number	37618
gnOduCfgXMaxTxLevel	4	Max Tx Level	20
gnOduStatusXTransmitLevel	4	Monitored Tx Level	0

- Configuration display
- MIB variables display
- Configuration can be saved and exported to Notepad, Word, Excel…

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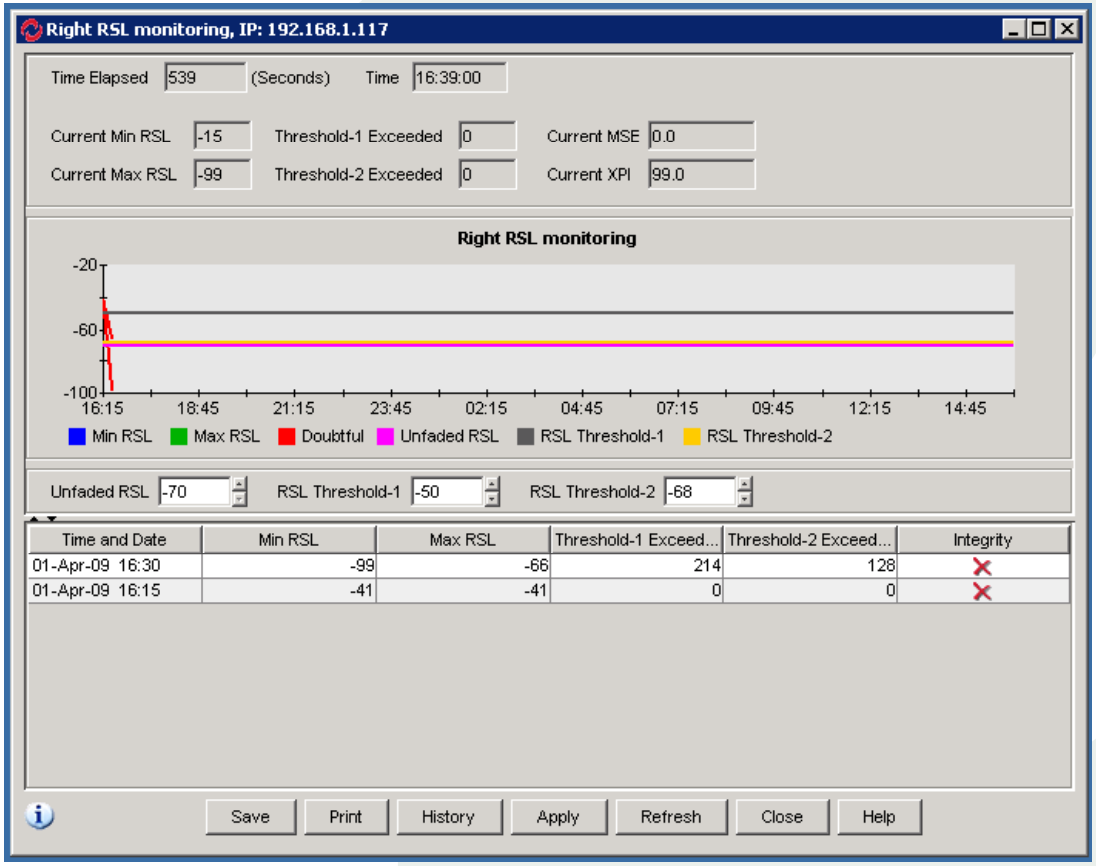
RSL Performance Monitoring



- Min and Max Receive Signal Level in 15 minutes intervals for last 24 hours
- Unfaded RSL configuration (expected RSL) and Thresholds
- Doubtful flag (Integrity) to indicate un-reliable readings

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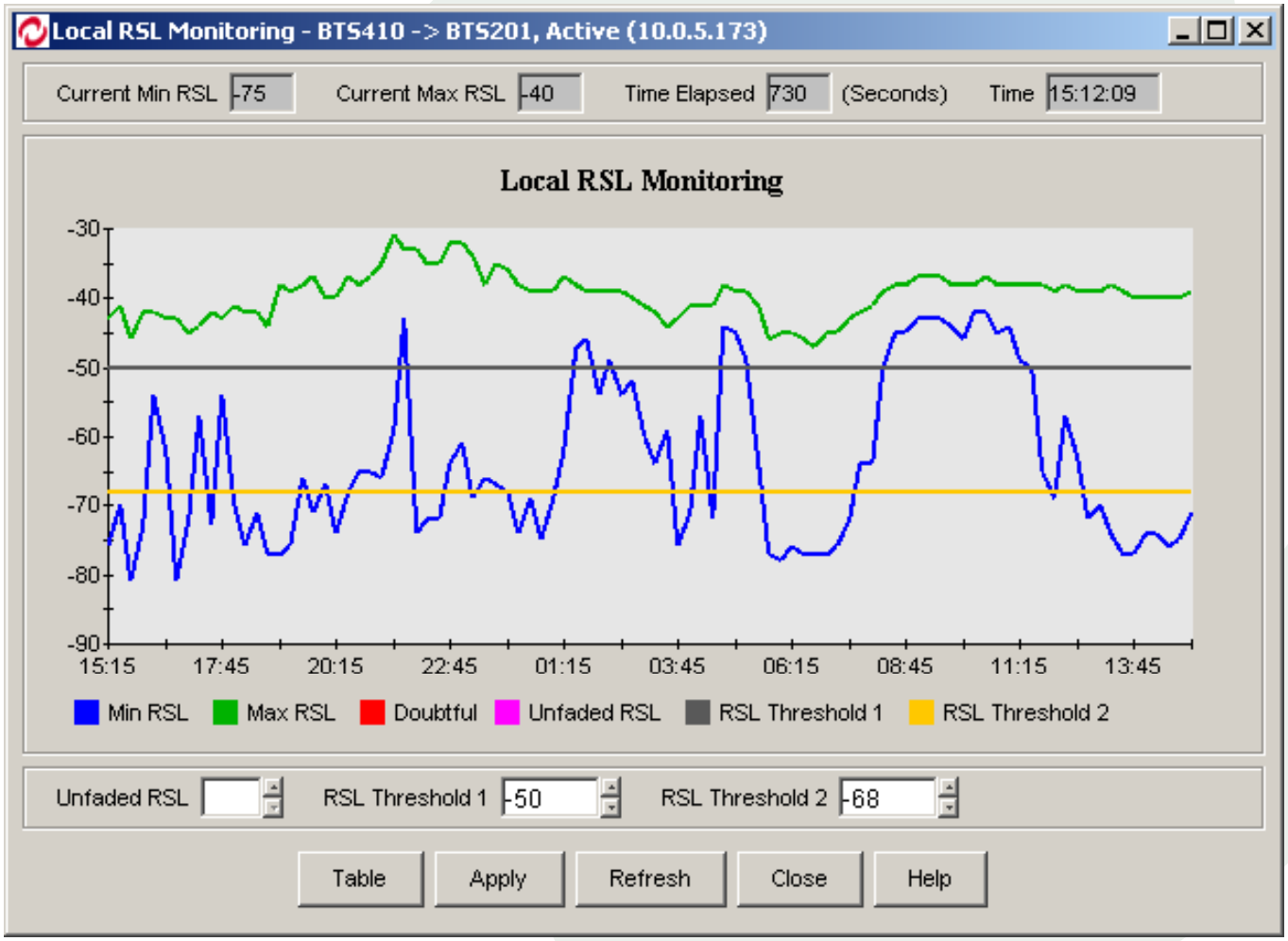
RSL – Multipath Example



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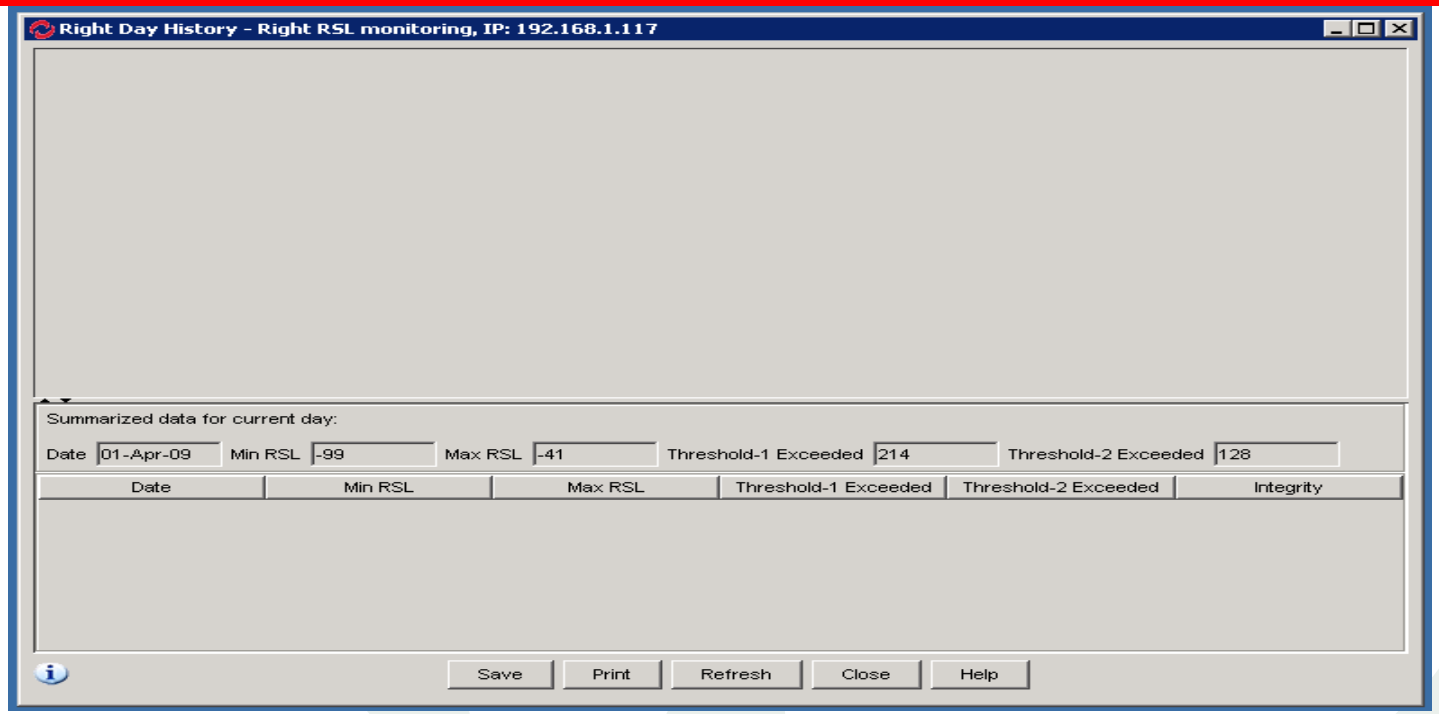
RSL History Table



- Min and Max Receive Signal Level in 24 hours intervals
- Counter of seconds that RSL was below thresholds
- Up to 30 days of history
- Table can be saved and exported to Notepad, Word, Excel…

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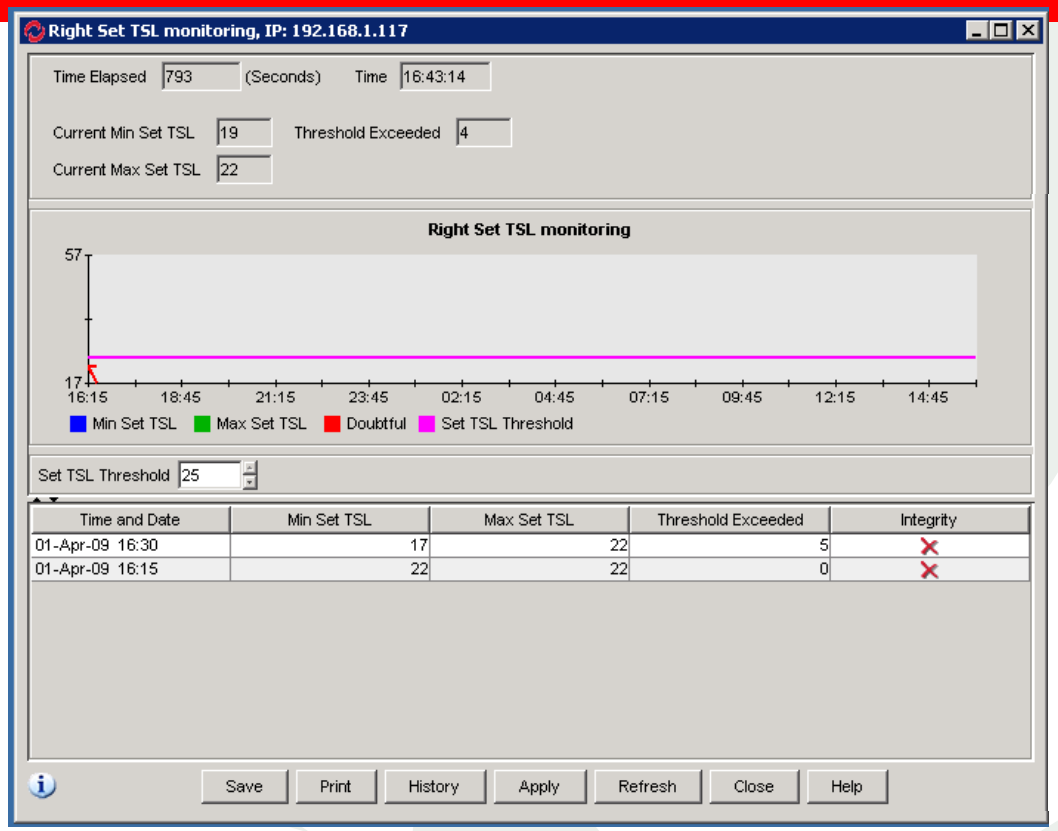
TSL Performance Monitoring



- Min and Max Transmit Signal Level in 15 minutes intervals for last 24 hours
- Threshold configuration
- Doubtful flag (Integrity) to indicate un-reliable readings
- Tables (24 hours and 30 days)

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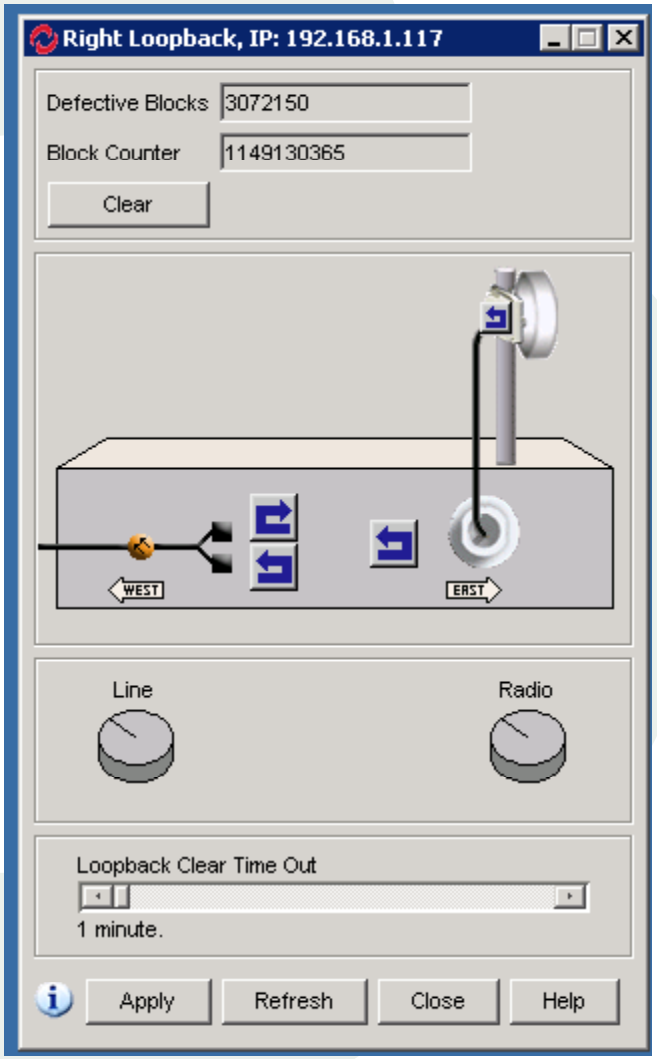
Troubleshooting Using RSL PM

- Check current RSL
- Check changes in RSL during last 24hours (5dB change during the day is normal)
- Identify rain fading, multi-path
- Check if RSL reached sensitivity threshold
- In case of ATPC, check Transmit Signal Level

Loopbacks

- IF loop – tests the entire drawer (Tx and Rx chains)
- ODU loop – tests the drawer and ODU
- Internal and External STM-1 Line loops
- Loop clear timeout configuration and display
- Block counter reflects the total number of blocks sent & received in loopback
- Defective blocks reflects the erroneous blocks in the loopback activity



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Troubleshooting Using Loopbacks

- If problem currently exists:
- Use Line loop in case of LOS, LOF or Errors on STM-1 input of IDU or external ADM
- Use IF loop in case of LOF or BER to identify if IDU is OK
- Use ODU loop in case of LOF or BER if IF loop passed OK

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Thank You !

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