RadioNet v3 Step-by-Step Guide
for NMC DC / Pro

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Contents

NMC Pro / DC Setup

1. Power off the NMC
2. Install NMC License Key on CPU card
3. If applicable, install NMC communication card, existing communication card is OK to use
4. Connect the NMC communication card to the Host with a shielded cable
   a. For RS232, you need three conductors and a shield
      i. NMC Upper TX to Host RS232 (2) RX
      ii. NMC Upper RX to Host RS232 (2) TX
      iii. NMC Upper COM to Host RS232 (2) GND
      iv. Cable shield to ground plate/bar (not GND terminal)
      v. Host LK1 & LK2 jumper on bottom 2 pins
   b. For RS485, you need two conductors and a shield
      i. NMC Upper A to Host RS485 A
      ii. NMC Upper B to Host RS485 B
      iii. Cable shield to ground plate/bar (not GND terminal)
      iv. Host LK1 & LK2 jumpers on top 2 pins
5. Power on the NMC and look for NEW CARD FOUND message and choose YES to install
   a. If you don't see this prompt,
      i. Power off the controller
      ii. Press and hold the LEFT ARROW key
      iii. Power on the controller, do not let go of LEFT ARROW key until you see the NEW CARD FOUND message, then select YES to install
6. Go to **NMC Menu 6.2** (Setup > System Setup)
7. Scroll down to **Remote Unit Type**
8. Press **ENTER** and choose **SN/RF Net**

RadioNet Host & Base Hardware Setup

1. Connect Host to Base radio with RJ12 cable (phone cable)
   a. The **Host RS485 IN** port connects to the **Base RS485 OUT** port
2. Connect antenna to Base radio
3. Record Base Radio SN (serial number) on outside of box or from inside backplate
4. Connect 12vDC power to Host

RadioNet RTU Hardware Setup

1. Record RTU SN (serial number) on outside of box or from inside backplate
2. Connect antenna to RTU radio
3. Connect the inputs and outputs
   a. Output (3 pin) terminal wire colors are marked near the terminal
   b. Input (2 pin) terminals are not polarity specific
4. Connect 6vDC power to RTU
   a. If using non-rechargeable lithium battery, secure battery with included velcro strap
   b. If using Solar Panel Kit,
      i. Install 6v rechargeable battery with included battery holder
      ii. Install charging regulator
      iii. Charging regulator jumper on **SLA**
      iv. Connect charging regulator output (light bulb symbol) to RTU power terminal

1. Red wire to +6V
2. Black wire to GND
v. Connect charging regulator battery terminals to battery
1. Red wire to + red battery terminal
2. Black wire to – black battery terminal
vi. Connect solar panel leads to charging regulator
1. Red wire to one of the two + terminals
2. Black wire to one of the two - terminals

Define your System in PoleNet

1. Getting Started (this step **requires Internet** access, once complete, Internet access is no longer needed)
    a. Download the latest version of PoleNet from CMT portal (http://www.netafimusa.com/cmt-portal)
    b. Locate **.zip** file and extract to a folder on your PC, **do not run polenet.exe from the .zip file**
    c. Connect the PoleNet programming cable to your PC and let Windows download required drivers
        i. This requires Administrator rights in Windows, ask your I.T. professional for help
        ii. You can check Device Manager > Ports to see if the USB to Serial adapter installed correctly
2. Get PoleNet ready for use
    a. Open PoleNet software, "**polenet.exe**"
        i. If this is the first time opening PoleNet, you will see a message stating the "User database has not been created yet." Click **OK** to create the database.
    b. Click **Configure Connection**
    c. Step 1 – Choose **Agile System v3**
    d. Step 2 – Choose **Agile radio**
    e. Step 3 – Choose **USB Serial Port**
        i. If you don't see the USB Serial Port, ask your I.T. professional for help
    f. Turn Advanced mode = **on**
    g. Click **OK**
3. Click **Compliance**
    a. Select **FCC**
    b. Click **OK**
4. Define a new Radio System
    a. Click "**Edit Systems in PoleNet**"
    b. Right-click in white space, click "New System"
    c. **System Type:** Agile system. Radio network.
    d. **System Name:** Enter a descriptive name for the project
    e. **Controller:** NMC PRO
    f. **Base ESN:** Enter the last 4 or 5 digits of the Base SN:
        i. Example 1 – Base has SN: 20211234 > PoleNet ESN should be **2021000000001234** (8 zero's)
        ii. Example 2 – Base has SN: 202112345 > PoleNet ESN should be **2021000000012345** (7 zero's)
    g. **Platform:** 209 (Radio base gateway)
    h. **Firmware:** Defaults to the latest firmware version, instructions for upgrading Base firmware below
        i. AgileBase vX.XX
    i. Click **OK**
    j. **Select** newly created system and click **Activate**
    k. Click **Yes** to switch current system
    l. ~~Double-click newly created system to edit, or **right-click** newly created system and click **Edit**~~
5. ~~Define RTU's~~

~~a.~~ ~~Right-click in white space, click "**New Unit**"~~

~~b.~~ ~~**Unit name:** Enter a descriptive name for the RTU (e.g. Valve 1, or Pump 2)~~

~~c.~~ ~~**ESN:** Enter the last 4 or 5 digits of the RTU SN:~~

    ~~i.~~ ~~Example 1 – If RTU has SN: 2021**1234** > PoleNet ESN should be **2021**000000000**1234** (8 zero's)~~

    ~~ii.~~ ~~Example 2 – If RTU has SN: 2021**12345** > PoleNet ESN should be **2021**00000000**12345** (7 zero's)~~

~~d.~~ ~~**Platform:**~~

    ~~i.~~ ~~207 (Radio remote with IO) for the 2 input x 1 output, expandable RTU~~

    ~~ii.~~ ~~307 (Radio remote 2x2) for the 2 input x 2 output RTU~~

~~e.~~ ~~**Firmware:** Defaults to the latest firmware version, instructions for upgrading RTU firmware below~~

    ~~i.~~ ~~AgileRemote vX.XX for the 2 input x 1 output, expandable RTU~~

    ~~ii.~~ ~~AgileRemote2x2 vX.XX for the 2 input x 2 output RTU~~

~~f.~~ ~~Click **OK**~~

~~g.~~ ~~Repeat steps A through F for any remaining RTU's~~

~~6.~~ ~~Add expansion cards to expandable RTU's~~

~~a.~~ ~~Right-click expandable RTU > **New Card**~~

~~b.~~ ~~Choose card type: **208 = 2 x DI, 2 x DO (MAX 4)** > Click OK~~

~~c.~~ ~~Choose slot number: **2 through 5**, reference slot number printed on expandable RTU > Click OK~~

~~d.~~ ~~Repeat steps A through C for any remaining expansion cards~~

7. Map NMC Outputs to RTU Outputs
   a. Click the **Mapping Edit** tab
   b. In the bottom left corner, uncheck **Display ESN**
   c. In the **left column**, pick the desired **NMC PRO Output #**
      i. You should choose a number that does not conflict with a physical NMC output, (i.e. if your controller has 16 – 24vAC outputs, start at NMC PRO Output 17
   d. In the **right column**, pick the desired **RTU output**
   e. Click the **<<** icon to assign the outputs together, PoleNet will move down to the next NMC PRO Output #
   f. **Repeat** steps C through E for any remaining output assignments

8. Map NMC Inputs to RTU Inputs
   a. Click the **Mapping Edit** tab
   b. In the bottom left corner, uncheck **Display ESN**
   c. In the bottom area, change **BIT Output** to **BIT Input**
   d. In the **left column**, pick the desired **NMC PRO Input #**
      i. You should choose a number that does not conflict with a physical NMC input, (i.e. if your controller has 8 – digital inputs, start at NMC PRO Input 9
   e. In the **right column**, pick the desired **RTU Input**
   f. Click the **<<** icon to assign the outputs together, PoleNet will move down to the next NMC PRO Input #
   g. **Repeat** steps D through F for any remaining output assignments

9. Define the radio Route:
   a. Click the **Route tab**
   b. In the bottom area, change **8 seconds** to **4 seconds**
      i. If you have a lot of RTU's or a lot of repeaters, the software will recommend the best setting
   c. In the bottom right area, verify **Optimize for fastest response**
   d. By default, all radios are children of the Base radio, only expandable RTU's can act as repeaters. To make any RTU go through a repeater…
      i. In the right pane, **right-click** the **RTU** > Click **Change Parent**
      ii. Select **new parent** from the drop-down list
      iii. Click **OK**

e. **Repeat** steps D for any remaining RTU's that need to go through a repeater
10. Click **Save**
11. Click **Exit**
12. Select the newly created system and click **Activate**
13. Click **Yes** to any question prompts

Programming the RTU's
1. Connect PoleNet **programming cable** between PC & RTU
2. Place **programming jumper** on RTU
3. Return to **PoleNet** software
4. Update RTU Firmware. This step may not be needed, Click **Connect**, and click the **About** button to find the RTU firmware version.
   a. Click **Firmware**
   b. Set Product to **AgileRemote** for expandable RTU, or **AgileRemote2x2** for the 2 input x 2 output RTU
   c. Verify **version**. By default, PoleNet selects the latest available version, if this matches the About screen skip the rest of step 4
   d. Click **Program**, PoleNet will erase & upload firmware to RTU
   e. Once the **Programming succeeded!** message appears, click **Exit**
5. Program RTU
   a. Click **Connect**
      i. Click **Put the unit into a Queue to be added to the activated system** option and click **Confirm**
      ii. If this is the last RTU in the system, click **Add the unit and Queued units to the activated system now** option and click **Confirm**
   b. Click **Setup Agile Radio**
      i. Click **OK** on warning prompt
      ii. **Operating Frequency:** Get this value from your FCC license
      iii. **Output Power:** Higher level uses more battery power, recommend solar panel kit if output power higher than 20 mW
      iv. **Open Circuit Test:** Check box for any output connected to a solenoid (relays don't draw enough power to pass the open circuit test, so don't check the box for relays or unused outputs)
      v. Comm check (h:mm):
         1. **When Idle:** 2:00
         2. **Output On:** If using solar panel kit, 0:05. If using lithium battery, 0:30 or longer
      vi. Click **ReProgram**
   c. Click **Monitor**
      i. Verify battery voltage is **near 6.00 V**, if below 5.00 make sure solar panel has sunshine or replace battery pack.
      ii. Click **Test**
      iii. Right-click populated RTU output
      iv. Click **On**,
         1. You should hear solenoid or relay **click** on
         2. State column should say 1, indicating the device activated
         3. Information column should say Override
            a. If you see Information column say Faulty O/C, this means a device is not connected to the output or the device is bad.
            b. If you see Information column say Faulty S/C, this means the device is shorted out, or the wires that connect the device to the RTU are shorted out.

i. If neither case above is true, it is possible you could have a faulty output on the RTU.
        v. Right-click the same RTU output
        vi. Click **Off**,
              1. You should hear the solenoid or relay **click** off
              2. The State column should say 0, indicating the device deactivated
              3. The Information column should say Override
        vii. **Repeat** steps iii to vi for any remaining RTU outputs
        viii. Click **Close**
    d. Click **Disconnect**
6. Remove **programming jumper** from RTU
7. Disconnect PoleNet **programming cable** from RTU
8. **Repeat** steps 1 through 7 for any remaining RTU's

Programming the Base

1. Connect PoleNet **programming cable** between PC & Base
2. Place **programming jumper** on Base
3. Return to **PoleNet** software
4. Update Base Firmware. This step may not be needed, Click **Connect**, and click the **About** button to find the Base firmware version.
    a. Click **Firmware**
    b. Set Product to **AgileBase**
    a. Verify **version**. By default, PoleNet selects the latest available version, if this matches the About screen skip the rest of step 4
    c. Click **Program**, PoleNet will erase & upload firmware to Base
    d. Once the **Programming succeeded!** message appears, click **Exit**
5. Program Base
    a. Click **Connect**
          i. In the Agile Radio box, you should see the ESN & Name of the Base
          ii. If you get an "Unknown Unit connected" error, it means that the Base SN was not correctly entered into the PoleNet database. Edit the database and fix the affected unit or add the missing unit to the system.
    b. Click **Setup Agile Radio**
          i. Click **OK** on warning prompt
          ii. **Operating Frequency:** Get this value from your FCC license
          iii. **Output Power:** 100 mW
          iv. Click **ReProgram**
6. Click **Disconnect**
7. Remove **programming jumper** from Base
8. Disconnect PoleNet **programming cable** from Base

Programming the Host

1. Connect PoleNet **programming cable** between PC & Host
2. Return to PoleNet
    a. Click **Configure Connection**
    b. Choose **Host unit**
    c. Click **OK**

3. Update Host Firmware
    a. Place **programming jumper** on Host (near reset button)
    b. Press the **reset button** on Host
    c. Return to **PoleNet**
    d. Click **Firmware**
    e. Set Product to **AgileHost**
    f. Verify **version**. By default, PoleNet selects the latest available version
    g. Click **Program**, PoleNet will erase & upload firmware to Base
    h. Once the **Programming succeeded!** message appears, click **Exit**
    i. Remove **programming jumper** from Base
    j. Press the **reset button** on Host
4. Program Host
    a. Click **Connect**
        i. If you get a "**Synchronize date/time**" error, click **Yes**
        ii. If you get an "**Host Capture**" error, it means the database version in PoleNet doesn't match the database version in the Host. PoleNet lets you decide which version to keep. For new systems, we want to **Store database version into Host (Restarts radio system).**
        iii. In the Agile Host v3 box, you should see the System name & Version time stamp, these should match the System & Version listed in the Agile System in PoleNet box.
    b. Click **Route Table**
        i. Click **Program**
        ii. Click **OK** on the completion notice
        iii. Click **Close**
    c. Click **Monitor**
        i. In the right area, check the **Show Unit Names** box
        ii. **Wait a few minutes** for the RTU reset process to finish
        iii. If successful, the **Present** column should say **Yes**. If you still have units missing, check the following on each RTU…
            1. Is the RTU connected to an antenna, and is the antenna in good working order (i.e. no cuts or kinks in the cable)?
            2. Is the RTU connected to a power source, and is the power source voltage correct (i.e. 6vDC)?
            3. Did you remember to remove the programming jumper from the RTU?
            4. Are all radios programmed to the same frequency?
        iv. Click the **Dig Outs** tab
        v. In the right area check the **Ignore Unused I/Os** box
            1. This hides outputs that you did not map to the NMC controller
        vi. In the right area check the **Show Unit Names** box
        vii. Check the **Information** column for any Faulty O/C or Faulty S/C messages
            1. If you see the Information column say Faulty O/C, this means open circuit. A device is not connected to the output or the device is bad, check for broken wires. A latching relay will cause a Faulty O/C message because it doesn't draw enough power to pass the test, this is a false positive, disable the Open Circuit test on RTU outputs connected to a latching relay.
            2. If you see the Information column say Faulty S/C, this means short circuit. A device is shorted out, or the wires that connect the device to the RTU are shorted out.
            3. If neither case above is true, it is possible you could have a faulty output on the RTU.

viii. On the NMC controller go to Menu > Test > Relays **(Menu 5.1)** and activate an RTU output and verify the operation with the PoleNet Monitor.

   1. When activating an RTU output you should see the desired column change from 0 to 1, the Information column will say Change to 1, after a few seconds you should see the actual column change to 1. If you have someone near the RTU, they should hear the solenoid or relay click.

ix. **Repeat** step viii to test any remaining RTU outputs

x. In PoleNet, click the **Dig Ins** tab

xi. On the NMC controller go to Menu > Test > Digital Input **(Menu 5.2)** to verify RTU inputs and verify the operations with the PoleNet Monitor.

   1. When activating an RTU input (like a float switch or water meter) you should see the value column increment for every on/off pulse of the input. You should see the same increment on the NMC Digital Input Test menu.

xii. Repeat step xi to test any remaining RTU inputs

xiii. Click **Close**

5. Click **Disconnect**
6. Disconnect PoleNet **programming cable** from Base