



RadioNet v3 Step-by-Step Guide

Updated 2018-09-25

Contents

NMC Pro / DC Setup.....	2
RadioNet Host Hardware Setup.....	2
RadioNet RTU Hardware Setup.....	2
Define your System in PoleNet.....	3
Programming the RTU's.....	4
Programming the Base.....	6
Programming the Host.....	7

NMC Pro / DC Setup

1. Power off the controller
2. Install NMC License Key on CPU card
3. If applicable, install NMC communication card, existing communication card is OK to use
4. Power on the controller 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
5. Menu 6.2 > Remote Unit Type = SN/RF Net

RadioNet Host Hardware Setup

1. Connect the Host to the NMC Pro/DC communication card 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
2. Connect Host to Base radio with RJ12 cable (phone cable)
 - a. Host RS485 IN to Base RS485 OUT
3. Connect antenna to Base
4. Connect 12vDC power to Host

RadioNet RTU Hardware Setup

1. Collect RTU serial number for use in PoleNet software
2. Connect antenna to RTU
3. Connect the inputs and outputs
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. Charging regulator jumper on SLA**
 - iii. Connect charging regulator output (light bulb symbol) to RTU power terminal
 - iv. Connect charging regulator battery terminals to battery
 - v. Connect solar panel leads to charging regulator

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
2. Get PoleNet ready for use
 - a. Open PoleNet software, "**polenet.exe**"
 - b. Click **Configure Connection**
 - c. Step 1 – Choose **Agile System v3**
 - d. Step 2 – Choose **Host unit**
 - 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**
 - h. Click "**Edit Systems in PoleNet**"
3. Define a new Radio System
 - a. Right-click in white space, click "New System"
 - b. **System Type:** Agile system. Radio network.
 - c. **System Name:** Enter a descriptive name for the project
 - d. **Controller:** NMC PRO
 - e. **Base ESN:** Enter the last 4 or 5 digits of the Base SN:
 - i. Example 1 – Base has SN: 20211234 > PoleNet ESN should be **202100000001234** (8 zero's)
 - ii. Example 2 – Base has SN: 202112345 > PoleNet ESN should be **202100000012345** (7 zero's)
 - f. **Platform:** 209 (Radio base gateway)
 - g. **Firmware:** Defaults to the latest firmware version, instructions for upgrading Base firmware below
 - i. AgileBase vX.XX
 - h. Click **OK**
 - i. Double-click newly created system to edit, or **right-click** newly created system and click **Edit**
4. 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 **202100000001234** (8 zero's)
 - ii. Example 2 – If RTU has SN: 2021**12345** > PoleNet ESN should be **202100000012345** (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
5. 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
6. 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
7. 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
8. 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
9. Click **Save**
10. Click **Exit**
11. Select the newly created system and click **Activate**
12. 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. Start PoleNet
 - a. Open PoleNet software, "**polenet.exe**"
 - b. Click **Configure Connection**
 - c. Step 1 – Choose **Agile System v3**
 - d. Step 2 – Choose **Radio unit**
 - 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**
 - h. Click "**Edit Systems in PoleNet**"
 - i. Select the newly created system and click **Activate**
 - j. Click **Yes** to any question prompts
4. Update RTU Firmware
- 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
 - 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. In the Agile Radio box, you should see the ESN & Name of the RTU
 - ii. If you get an "Unknown Unit connected" error, it means that the RTU 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 **Compliance**
 - i. Select **FCC**
 - ii. Click **OK**
 - c. Click **Setup Agile Radio**
 - i. Click **OK** on warning prompt
 - ii. **Operating Frequency:** Get this value from your FCC license
 - iii. **Network Identifier:** 1
 - iv. **Output Power:** Higher level uses more battery power, recommend solar panel kit if output power higher than 20 mW
 - v. Check **12.5 kHz Channels**
 - vi. Uncheck 6.25 kHz offset
 - vii. Uncheck any **Open Circuit Test** boxes where there is NO solenoid connected, or if a RELAY is connected. (Relays don't draw enough power to pass the open circuit test.
 - viii. Uncheck any unnecessary **Report ASAP** boxes (this should only be checked if you have a digital input that controls an aspect of irrigation, e.g. a float switch for a pump)
 - ix. 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
 - x. Din Reporting: Unless you are connecting a water meter to one of the digital inputs, set these fields to **Off**
 - xi. Rate Window: Same as above
 - xii. Click **ReProgram**
 - d. Click Check Plug-in Cards
 - i. All Status values should be Correct, if not, you need to compare your RTU setup to what you defined in the PoleNet Database and make corrections where necessary.
 - ii. Click Close
 - e. Click Monitor
 - i. Verify battery voltage is **above 6.00 V**
 - 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
6. Click **Disconnect**
 7. Remove programming jumper from RTU
 8. Disconnect PoleNet programming cable from RTU
 9. **Repeat** steps 1 through 8 for any remaining RTU's

Programming the Base

1. Connect PoleNet programming cable between PC & Base
2. Place programming jumper on Base
3. Start PoleNet
 - a. Open PoleNet software, "**polenet.exe**"
 - b. Click **Configure Connection**
 - c. Step 1 – Choose **Agile System v3**
 - d. Step 2 – Choose **Radio unit** (the Base is a 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**
 - h. Click "**Edit Systems in PoleNet**"
 - i. Select the newly created system and click **Activate**
 - j. Click **Yes** to any question prompts
4. Update Base Firmware
 - a. Click **Firmware**
 - b. Set Product to **AgileBase**
 - c. Verify **version**. By default, PoleNet selects the latest available version
 - d. Click **Program**, PoleNet will erase & upload firmware to Base
 - e. 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 **Compliance**
 - i. Select **FCC**
 - ii. Click **OK**
- c. Click **Setup Agile Radio**
 - i. Click **OK** on warning prompt
 - ii. **Operating Frequency:** Get this value from your FCC license
 - iii. **Network Identifier:** 1
 - iv. **Output Power:** 100 mW
 - v. Check **12.5 kHz Channels**
 - vi. Uncheck 6.25 kHz offset
 - vii. 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. Place **programming jumper** on Host (near reset button)
3. Press the **reset button** on Host
4. Start PoleNet
 - a. Open PoleNet software, "**polenet.exe**"
 - b. Click **Configure Connection**
 - c. Step 1 – Choose **Agile System v3**
 - d. Step 2 – Choose **Host unit** (the Base is a 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**
 - h. Click "**Edit Systems in PoleNet**"
 - i. Select the newly created system and click **Activate**
 - j. Click **Yes** to any question prompts
5. Update Host Firmware
 - a. Click **Firmware**
 - b. Set Product to **AgileHost**
 - c. Verify **version**. By default, PoleNet selects the latest available version
 - d. Click **Program**, PoleNet will erase & upload firmware to Base
 - e. Once the **Programming succeeded!** message appears, click **Exit**
 - f. Remove **programming jumper** from Base
 - g. Press the **reset button** on Host
6. Program Host
 - a. Click **Connect**
 - i. 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 **Program database version into Host (Restarts radio system)**.
 - ii. 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. Use the Test > Relays menu on the **NMC controller (Menu 5.1)** to 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. Click the **Dig Ins** tab
 - xi. Use the Test > Digital Input menu on the **NMC controller (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 > Test > Digital Input menu.
 - xii. Click **Close**
7. Click **Disconnect**
8. Disconnect PoleNet **programming cable** from Base