

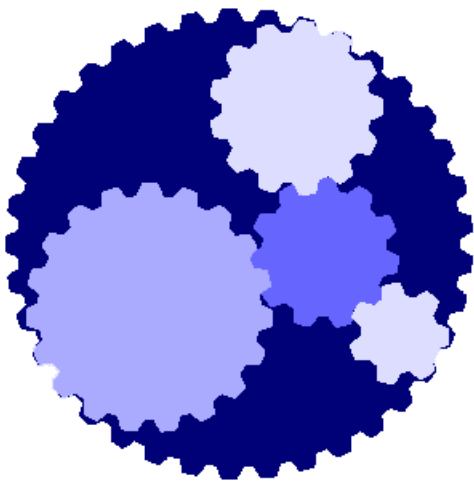
Course 106

Technician Role:

Installing Wavenis AMR on Water Meters



The NEXT Generation AMR



Plug and Play Scada

- **Gives you the power to configure your own AMR, via easy to use User interfaces**

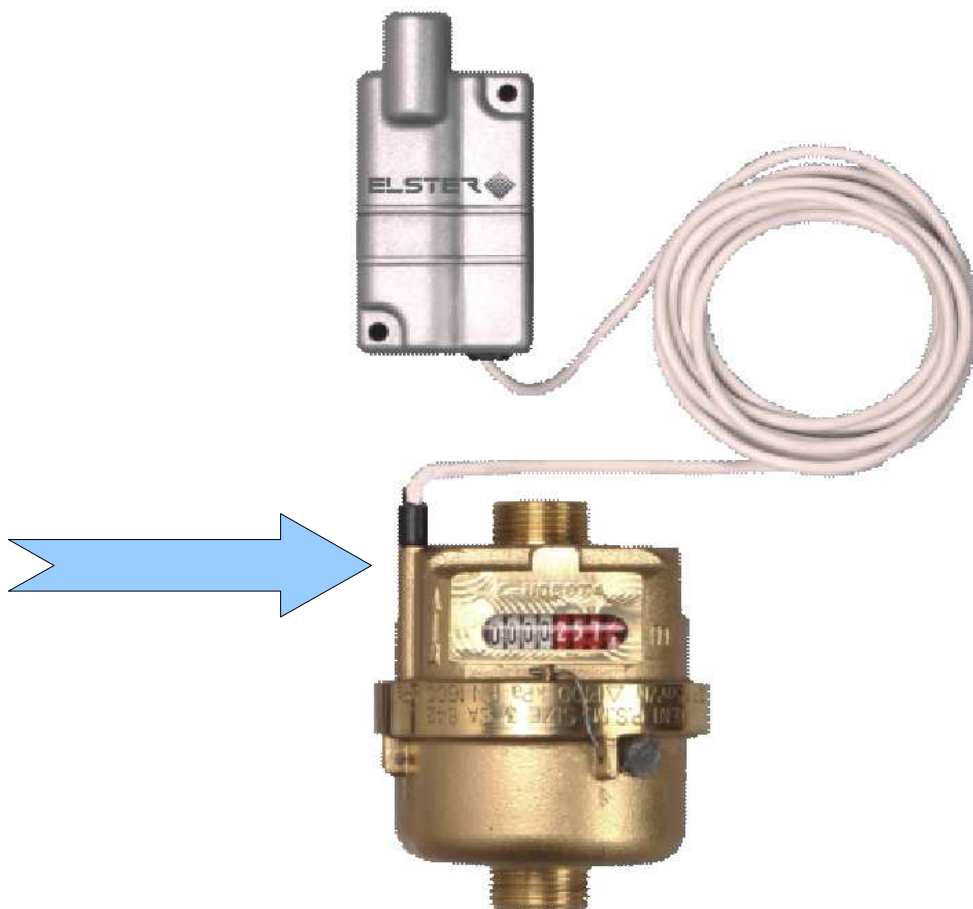
Once you are done with this Course, you should be able to:

- **Correctly install Wavenis AMR equipment on compatible Water Meters for Automatic Meter Reading.**
- **Set the correct Pulse Constant using Wavenet Explorer.**
- **Synchronize the Manual Meter Reading with the Automatic Meter Reading using Wavenet Explorer.**
- **Check that the Automatic Meter Reading counts up correctly using Wavenet Explorer.**
- **Check the RF signal strength using Wavenet Explorer, and install Repeaters if necessary.**

MODULE 1:

Physical Installation of WaveFlow (MIU) and Reed Switch (probe)

***Step 1: Locate the hole
in the water meter and
insert the Probe***



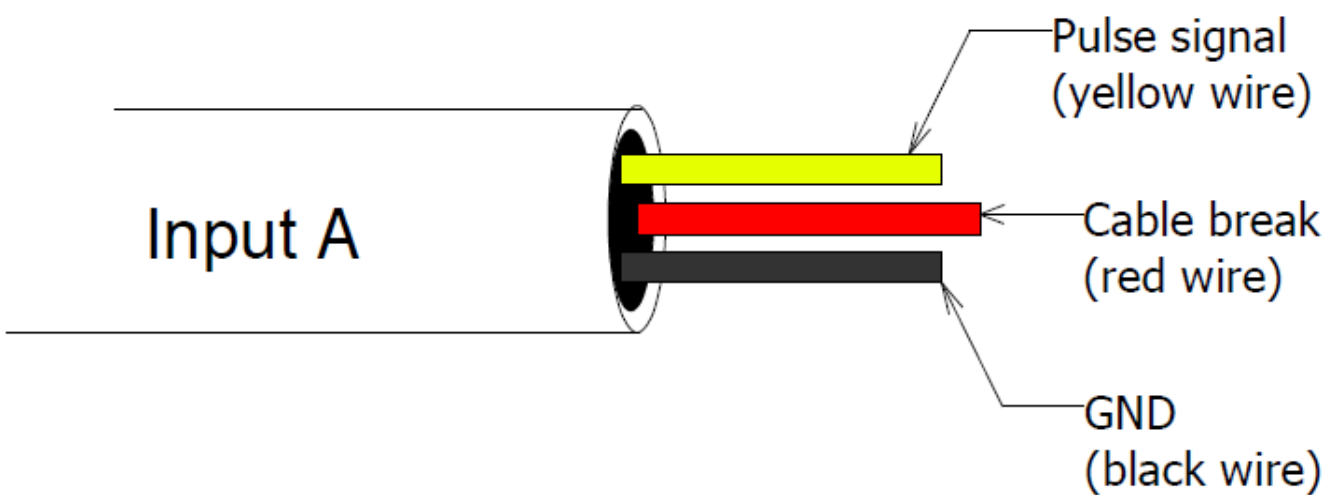
- Domestic water meters often have a hole somewhere for a Reed Switch (probe).
- The probe works by making a contact when a magnetized part of the meter dial comes near the probe, creating a pulse, that can be counted by the AMR equipment.
- Look for a small circular hole, typically with another small hole right next to it for a screw to hold the probe bracket in place.
- Remember to first put the wire through the bracket before connecting it to the MIU, and screw down the bracket onto the meter.

Step 1b: ... or is it a Bulk Meter?

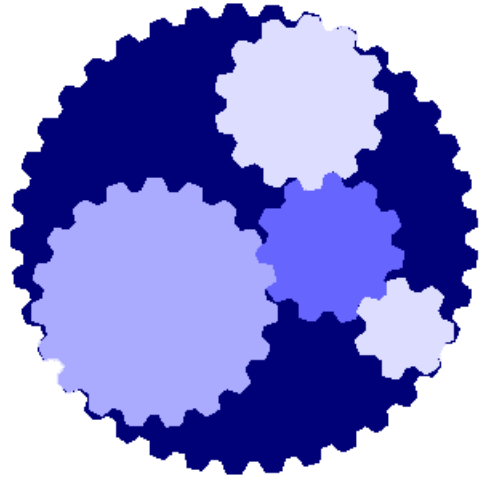


- Bulk Meters often does not take a Reed Switch probe, but another kind of device that is fixed to the meter face plate, for example an Elster PR7 or SR7.
- Find out from your Bulk Meter manufacturer what is the correct device to use.
- The device would typically also generate at least one pulse - same as the probe - which can also be counted by the MIU.

Step 2: Connect the Probe wires to the MIU



- The typical MIU can measure 4 different meters.
- There one to 4 cables coming out of the MIU, each with 3 cores.
- Meter A to D is generally on cable 1 to 4, but sometimes there are 2 cables with A and B on cable 1 and C and D on cable 2.
- Using Silicon Gel IP68 connectors, connect the correct MIU wires (Pulse signal and Ground) to the correct probe wires (usually it doesn't matter which way around you put it).



Exercise

Module 1

Exercise:

As part of this course, you have been issued a Meter, Probe and MIU.

Install the Probe correctly in the Meter, and connect the Probe wires correctly to Meter Channel B on the MIU.

Call the Lecturer if you have any questions, and when you're done.

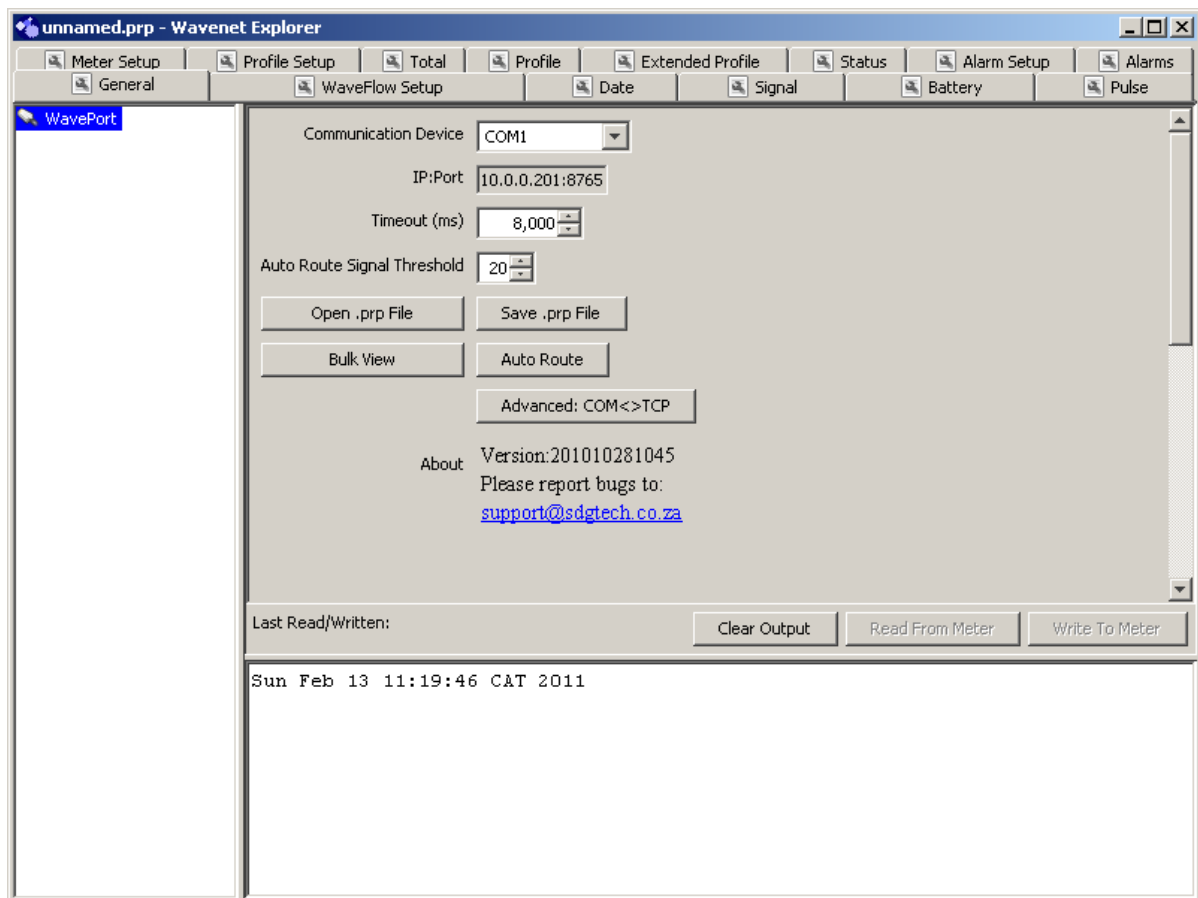
MODULE 2:
Introducing
WavenisExplorer
Step 1: Connect your
WavePort with your
Computer



- Plug your WavePort into your Windows Computer.
- Make sure you know which COM port number it is connected on.
- For USB WavePorts, you can go to Control Panel; System; Hardware; Device Manager; Ports, to see a list of possible Ports
- Make sure all your Wavenis RF hardware operate at the same frequency, e.g. 868MHz. This includes your RF Concentrator box and your Waveport used with your laptop computer, as well as any MIUs, Repeaters, and Remote Shutoff Valves you may have. Usually, all equipment should be 868 MHz.

Step 2:

Open WavenetExplorer



- The program is called ***WavenetExplorer.exe*** and is on the CD you've been given.
- Insert the CD into your drive, copy the file to your Desktop, and double click to run.
- The password for the default software is 'test'.
- When it prompts you the first time for a file to open, click on Cancel. It will automatically use unnamed.prp as the filename, in the same directory (e.g. Desktop) as your program.
- In the General Tab, enter your COM port number in the Communication Device field that you determined in Step 1.

Step 3: Add an MIU



unnamed.prp - Wavenet Explorer

Meter Setup | Profile Setup | Total | Profile | Extended Profile | Status | Alarm Setup | Alarms

General | WaveFlow Setup | Date | Signal | Battery | Pulse

WavePort

- New Wave Flow Ctrl+N
- New Repeater Ctrl+R
- Copy Serial Ctrl+C
- Paste Serials Ctrl+P
- Delete Delete
- Search Ctrl+S
- Verify All in this node Ctrl+E
- Toggle verify for this node Ctrl+T
- Unverify All in this node Ctrl+U
- Help

Device: COM1

IP:Port: 10.0.0.201:8765

out (ms): 8,000

Threshold: 20

Save .prp File

Auto Route

Advanced: COM<>TCP

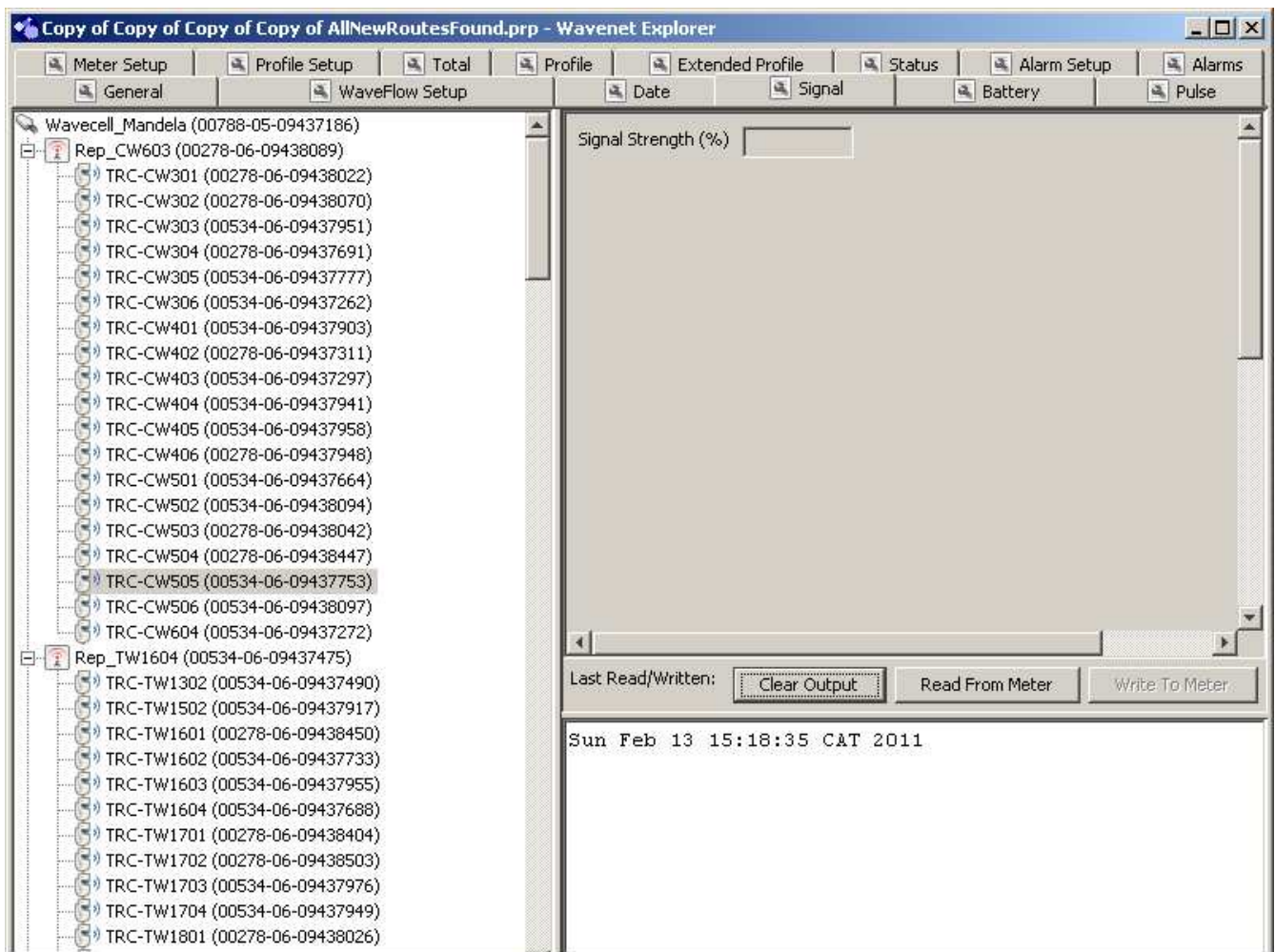
About: Version:201010281045
Please report bugs to:
support@sdgtech.co.za

Last Read/Written: Clear Output Read From Meter Write To Meter

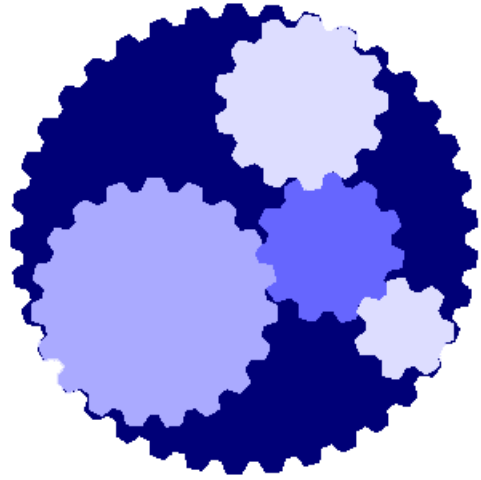
Sun Feb 13 11:19:46 CAT 2011

- Right click 'WavePort' in the left top, and select 'New Wave Flow'.
- Enter the Radio Address as physically printed on the MIU in the 'Serial:' field, and a human readable description in 'Description:'.
- Click the OK button to add the MIU to the tree.

Step 4: Reading the MIU Signal Strength



- With the MIU selected in the tree control, select the Signal Tab.
- Push the 'Read from Meter' button to read the signal strength between the Waveport and the MIU.
- It should come back with the MIU's signal strength as a percentage.
- If it failed, it is usually your COM port setting that is wrong (General tab), or the radio address that was entered incorrectly (WaveFlow Setup tab).



Exercise

Module 2

Exercise:

Read the Signal Strength of your MIU, using WavenetExplorer.

Read the Battery Level of your MIU, using WavenetExplorer.

Call the Lecturer if you have any questions, and when you're done.

MODULE 3:

Configuring a Meter on the MIU

Step 1: Setting the Pulse Constant

The screenshot shows the Wavenet Explorer software interface. The window title is "unnamed.prp - Wavenet Explorer". The main menu includes Meter Setup, Profile Setup, Total, Profile, Extended Profile, Status, Alarm Setup, and Alarms. The sub-menu includes General, WaveFlow Setup, Date, Signal (with a red X icon), Battery, and Pulse. The left sidebar shows "WavePort" with a "Test" button. The main area displays a table for configuring four meters:

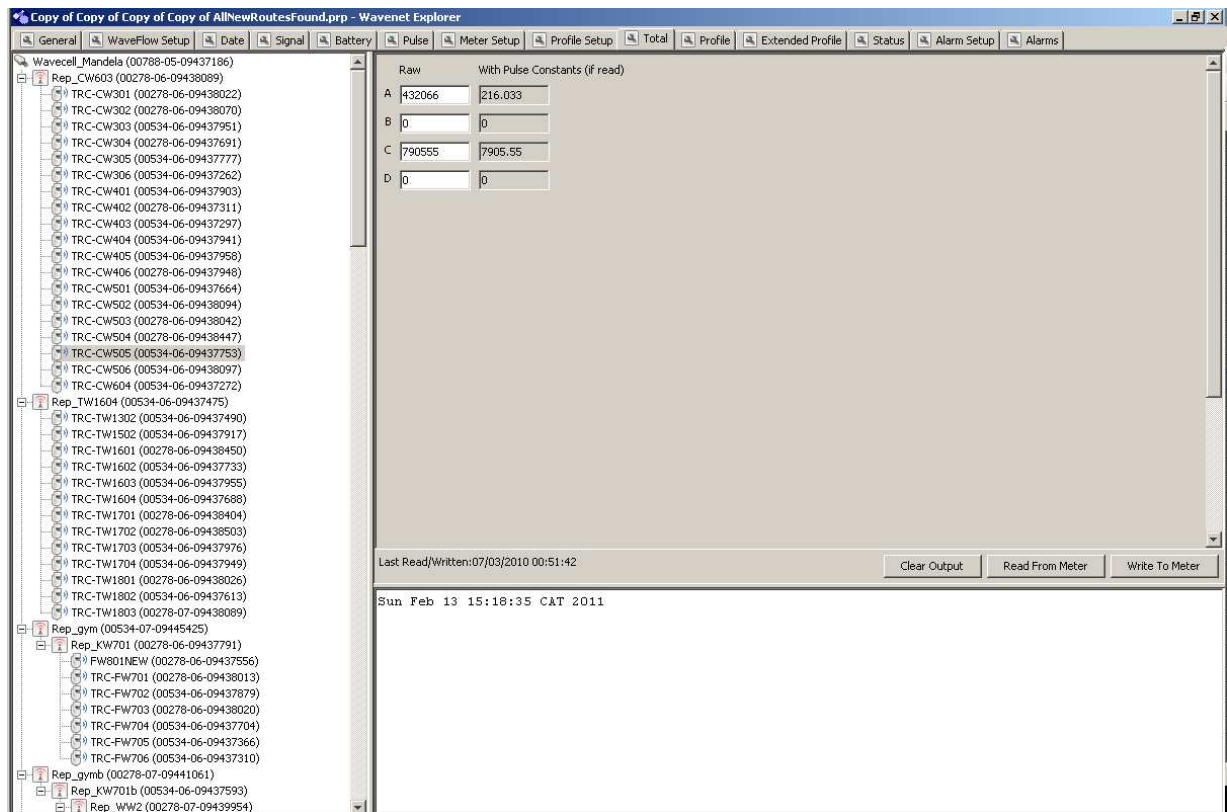
	Value	Exponent	Final Multiplier
Meter 1	1	10 ⁻⁶ milliliter	0.000001
Meter 2	1	10 ⁻⁶ milliliter	0.000001
Meter 3	1	10 ⁻⁶ milliliter	0.000001
Meter 4	1	10 ⁻⁶ milliliter	0.000001

Below the table are buttons for "Clear Output", "Read From Meter", and "Write To Meter". At the bottom, a terminal window shows the following output:

```
Opening COM:1
loading JavaCOM...done
starting read of 00000-00-00000000
timeout while waiting for input
timeout while waiting for input
timeout while waiting for input
ERROR
timeout, all retries failed
```

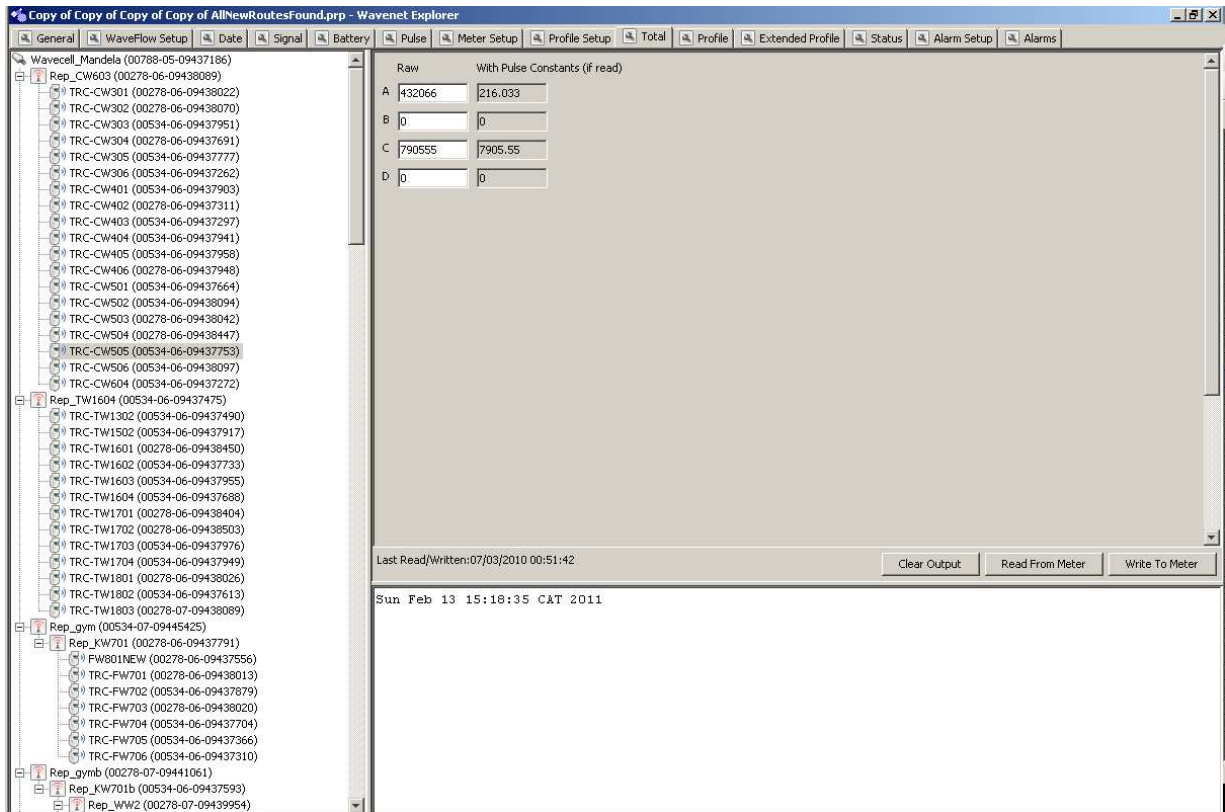
- With the MIU selected in the tree control, select the Pulse Tab.
- Push the 'Read from Meter' button to read the current Pulse battery level of the MIU.
- It should come back with a set of current Pulse Settings for all 4 potential pulse meters.
- The Pulse Constant is how many kilo-liters are represented by 1 pulse.
- 1 Kilo-liter is equivalent to one cubic meter of water.
- The Pulse Constant is decided at manufacturing time: ask your Meter Manufacturer or read your meter documentation to determine the Pulse Constant.
- The typical value for a 25mm Domestic Elster Water Meter is 0.005 ($5 * 10^{-3}$). Which is to say, one pulse is 5 liters.
- The typical value for a 20mm Domestic Elster Water Meter is 0.0005 ($5 * 10^{-4}$). Which is to say, one pulse is half a liter, or 5 deciliters.
- Set the appropriate meter pulse constant accordingly, and push the 'Write To Meter' button to set the constant in the MIU.

Step 2: Synchronizing the Meter Reading

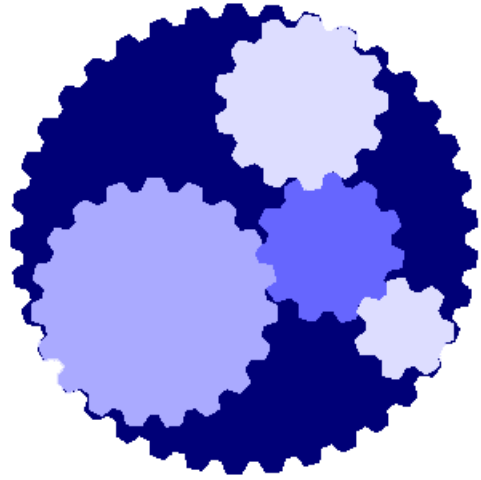


- With the MIU selected in the tree control, select the Total Tab.
- Push the 'Read from Meter' button to read the current Total values from the MIU.
- Set the appropriate total to the corresponding physical total reading on the Water Meter, and press the 'Write To Meter' button.
- Your Meter Readings are now synchronized.
- Read it again just to be sure it was successfully written.

Step 3: Verify the Installation



- With the MIU installed and synchronized, let the water meter count on.
- If the water meter counter is changing, that is great: just wait a little bit, e.g. for about 20 liters.
- Otherwise you might have to open a tap to get it to count up for a bit, or come back much later when it has had a chance to count up.
- With the relevant MIU selected and the Total Tab selected, push the 'Read from Meter' button to read the current Total values from the MIU.
- Compare the returned values in WavenetExplorer to the physical meter reading.
- If the readings match, you have successfully verified the installation, otherwise there is a mistake somewhere: check your installation again for any inconsistencies.
- If the counter has counted on, but the wrong quantity , it could be:
 - wrong pulse constant
 - wrong meter
 - faulty reed switch
- If the counter has not counted on at all, it could be:
 - wrong meter (check other channels)
 - faulty reed switch installation (try rotating it 20 degrees)
 - faulty reed switch or cables.
- You can configure your Remote Shutoff Valve in the same way as a normal MIU. Use the Coronis IndexManager software to switch the valve.



Exercise

Module 3

Exercise:

Configure your meter correctly on your MIU using WavenetExplorer.

Save your initial settings and initial readings to another prp file by Pushing the 'Save .prp File' button on the General tab. Save it to a file called 'initial.prp'.

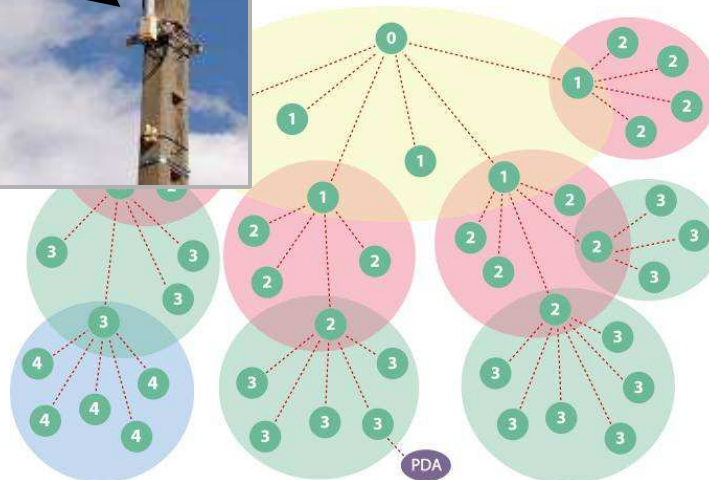
Now let the meter count up, and then verify the installation. Once you have verified it, save your settings and readings to a prp file called 'verified.prp'.

Call the Lecturer if you have any questions, and also when you're done, so he can check your '.prp' files and your physical meter to see if you managed to install the meter correctly.

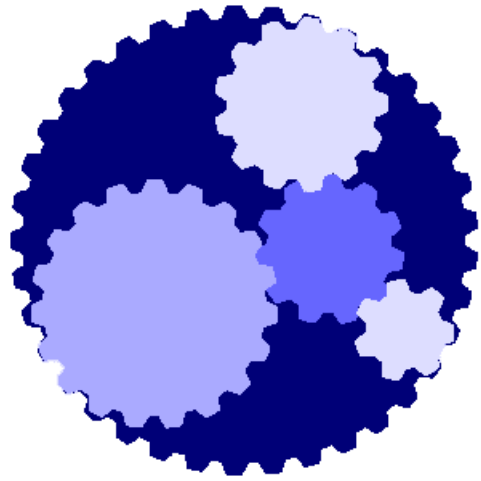
MODULE 4:

Configuring an RF Mesh with WavenetExplorer

Step 1: Read your Signal Strength on site



- For your real world installation, try to read the signal strength of your MIU with WavenetExplorer **while holding your waveport next to the RF Concentrator box.**
- If it fails to read, retry 3 to 5 times, a few minutes apart.
- If the signal is low, or it completely fails to read, it might be necessary to install one or more Repeaters.
- Wavenis allows an RF Mesh with up to 4 hops from the RF Concentrator box to the MIU.
- There are separate units called Repeaters (also called WaveTalks) that can be put inbetween for the signal to 'hop' over.
- MIUs are also Repeaters by default.
- You can add a Repeater to WaveNet explorer in the same way that you add an MIU, but select 'New Repeater' instead of 'New Waveflow'.
- Go with your notebook computer to hunt for signal: go to a place near the RF Concentrator box, or with fewer obstacles inbetween, from where you can read the MIU, and try to read its signal strength from there.
- If you succeed, put down a repeater, and then go back to your RF Concentrator and see if you can read the signal strength on the new repeater.
- If successful, drag and drop the MIU into the Repeater on the WavenetExplorer Tree control: it will now read the MIU THROUGH the Repeater. Try to read the Signal Strength of the MIU again. It should work.
- Take into consideration: the batteries on MIUs and Repeaters generally last 10 years, but as you increase the traffic over 1 node, its battery level will drop faster.



Exercise

Module 4

Exercise:

Add the Repeater of the Lecturer to your Wavenet Explorer. (he will give you the radio address)

Configure your MIU to be read through the Repeater.

Read the Date of the MIU through the Repeater.

Call the Lecturer if you have any questions, and when you're done.