

APPLICATION NOTE – AN203 Network Addressing

Introduction

Electrochem's sensors and base stations are both factory set to have the same default networking parameters stored in their memory. If there are multiple sensors attempting to communicate, for example, on the same communication channel, then there will be interference. One way to work around this would be to change the *Channel* and/or *PAN ID* parameters of the sensor as well as the base station. This application note describes how to properly configure a sensor with a base station.

How to Configure Network Addressing Parameters

Start by entering a *Radio AT* command, as described in the *Radio AT (RAT)* application note and in the *RAT* section of the user manual, to alter the desired networking parameter of the sensor. This command may be entered into the *X-CTU* terminal window. Note that only a response data frame will be returned at this time to indicate that a command has been sent to the sensor. Next, in order to configure the base

📭 х-сти [сомз]					
PC Settings Range Test Terminal Modem Configuration					
Modem Parameters and Firmware Parameter View Profile	Versions				
Read Write Restore Clear Screen Save	Download new				
Always update firmware Show Defaults Load versions					
Modem: XBEE Function Set	Version				
XBP24 XBEE PRO 802.15.4	▼ 10A4 ▼				
🖃 🔄 Networking & Security	~				
📄 (0D) CH - Channel OD					
📔 (3332) ID - PAN ID					
📮 (0) DH - Destination Address High					
🔲 📓 (0) DL - Destination Address Low					
(0) MY - 16-bit Source Address					
[13A200] SH - Serial Number High (13A200) SH - Serial Number High					
(40002623) SL - Senai Number Low					
(0) RN - Bandom Delau Slots					
(3) MM - MAC Mode					
19) NT - Node Discover Time					
🔓 (1FFE) SC - Scan Channels					
冒 (4) SD - Scan Duration					
📮 (0) A1 - End Device Association					
💮 🔤 (0) A2 - Coordinator Association					
🔲 📄 (0) Al - Association Indication					
0) EE - AES Encryption Enable					
KY - AES Encryption Key	×				
Set/read the channel number (Uses 802.15.4 channel numbers).					
RANGE:0XC-0X17					
COM3 57600 8-N-1 FLOW:NONE XBP24 Ver:10A4					

station, select the Modem Configuration tab, also in the X-CTU application, and then click the Read button. Under the Networking & Security section, the Channel and PAN ID, along with other parameters may be changed. To do this, select which parameter will be changed, and then enter the desired parameter data into the text box. Figure 1 illustrates how to change the communication channel of the base station. In order for this data to be stored to the modem, click the Write button. This will ensure that the parameters are stored in non-volatile memory. Once the base station's parameters have been set, the sensor's networking parameters can be configured, using the same RAT command as stated above. Figure 2 illustrates the complete code for how to properly change the communication channel of the

Figure 1: X-CTU Modem Configuration Window

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sensor, as well as store that information to the sensor's flash memory. The terminal window in Figure 2 displays five different packets of commands. The first is the RAT command which changes the communication channel. Second is the Sensor Factory Unlock (SFU) command which enables the overwriting of data into RAM. Third is the *RAT* command which actually writes the information to sensor's RAM. Fourth is the Sensor Save Enable (SSE) command which enables the saving of data from RAM to flash memory. Last is the Sensor Memory Save (SMS) command which actually stores the data to the sensor's flash memory. Displayed in the Send Packet window in Figure 2 is the code for reading the sensor's Channel parameter. This command is simply a check which ensures that the data has been stored to the sensor's flash

😬 х-сти [сомз]				
PC Settings Range Te	est Terminal Modem Cor	nfiguration		
Line Status As	RV RTSV Break	Close Assemb Com Port Packe	le Clear Hide Screen Hex	
~R.e.BCH m~R. \$~e%.B.C H.'~R. {.~R. \$~e\$.(~R. \$~e \$.B.WR. ~R. \$~e \$.B.WR. ~R. \$~e \$R. \$~e \$R.	7E 00 09 01 52 6D 7E 00 03 89 00 65 25 00 42 06 01 52 00 65 52 00 24 7E 00 60 CD 7E 00 08 52 SC 7E 00 03 81 00 65 24 00 00 06 01 52 00 89 52 00 24 7E 26 00 CF 7E 00 20 7E 00 03 89 00 65 25 00 27	00 65 00 4 9 52 00 24 7 00 43 48 0 00 28 1F 7 007 81 00 6 01 52 00 2 42 00 57 52 42 00 57 52 00 07 81 0 00 00 7 52 00 07 81 0 00 07 81 0 00 07 81 0 00 07 81 0 00 07 81 0 00 07 81 0 00 01 52 0 9 52 00 24 7 00 CD 24 7	2 43 48 0D E 00 0A 81 0 27 7E 00 E 00 03 89 5 24 00 28 5 00 42 57 4 7E 00 0A 2 00 0A 7E 1 7E 00 03 1 7E 00 03 65 24 00 0 65 24 00 0 65 00 27 E 00 07 81	
end Packet				×
7E 00 08 01 52 00 65 00	I 42 43 48 7A			
, Byte count: 12		Disp	olay	
Close Send	Data		Clear C	ASCII
COM3 57600 8-N-1	FLOW:NONE	Rx: 96 byte	S	

Figure 2: X-CTU Terminal Window

memory. For additional information on how to use the *Radio AT* command, consult the *Radio AT* (*RAT*) application note.

Conclusion

After the communication channel has been changed for both the base station and the sensor, the *PAN ID* parameter can be changed for an extra level of networking security. However, be sure to change only one parameter at a time. An exact byte by byte description of the *Command Data Frame Structure* can be found in the *RAT* section of the user manual.