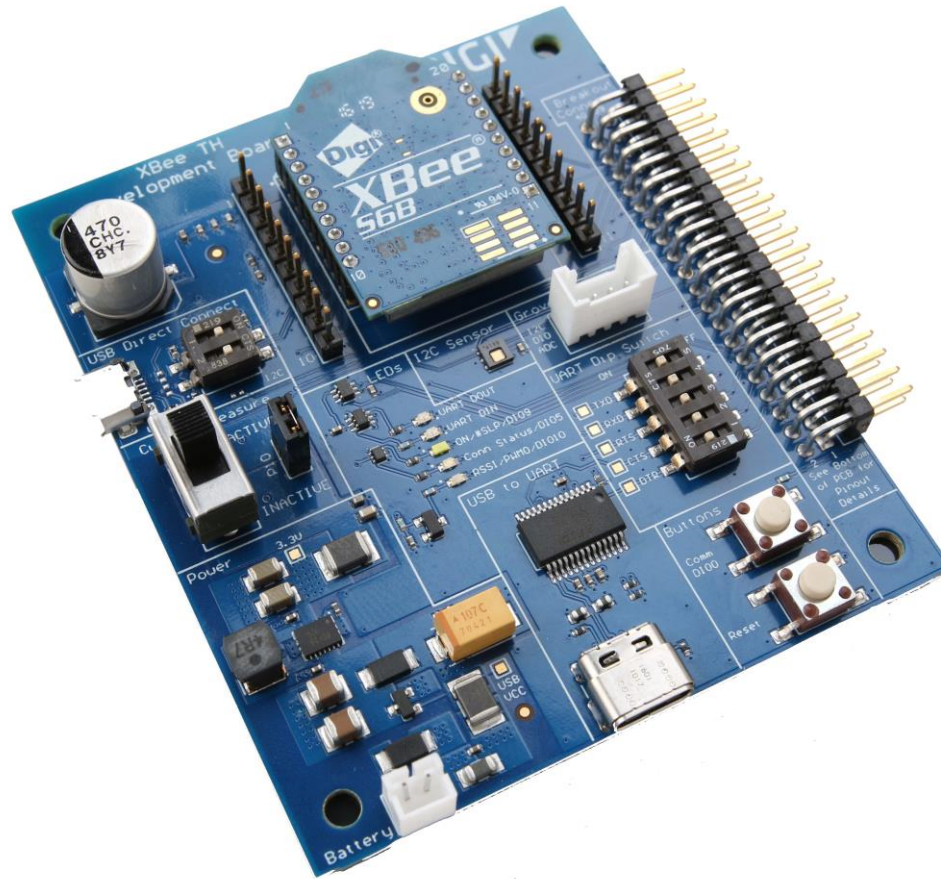


XBee Radio Modules



Digi XBee Wi-Fi On Your Phone

January 31, 2020

Fred Eady

Presented by:

DesignNews

Information Classification: General

CEC CONTINUING
EDUCATION
CENTER



XBee Radio Modules

AGENDA

- Network Configuration
- Addressing
- DIO Configuration
- Coding the Android App
- Day 5 Summary



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XBee Radio Modules

Network Configuration

Radio Modules

Name: [X]
Function: XBEE WI-FI
Port: COM9 - 9600/8/N/1/N - AT
MAC: 00000004F31D8209

Radio Configuration [- 00000004F31D8209]

Read Write Default Update Profile

Parameter []

Product family: XB2B-WF Function set: XBEE WI-FI Firmware version: 2026

Active Scan results

Select the access point to connect.

SSID name	Link Mar...	Security	Channel	Quality
Hicks Wi-Fi Network	12	WPA2	1	24%
Michael's Guest Network	10	WPA2	1	20%
MySpectrumWiFi90-2G	2	WPA2	6	4%
DIRECT-8A-HP OfficeJe...	24	WPA2	11	48%
edtpnet	63	WPA2	11	100%
edtpnet2	16	WPA2	11	32%
DIRECT-6F-HP OfficeJet...	13	WPA2	11	26%

Refresh list

Access Point settings

Enter the password for the selected access point.

.....

Save the SSID configuration in the module.

Connect Cancel

XBee Radio Modules

Network Configuration

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.17763.914]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\fred>ping 192.168.1.152

Pinging 192.168.1.152 with 32 bytes of data:
Reply from 192.168.1.152: bytes=32 time=55ms TTL=64
Reply from 192.168.1.152: bytes=32 time=3ms TTL=64
Reply from 192.168.1.152: bytes=32 time=5ms TTL=64
Reply from 192.168.1.152: bytes=32 time=5ms TTL=64

Ping statistics for 192.168.1.152:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 55ms, Average = 17ms

C:\Users\fred>_
```


XBee Radio Modules

Network Configuration

The screenshot displays the XCTU (Xbee Configuration Test Utility) software interface. The window title is "XCTU" and the menu bar includes "XCTU", "Working Modes", "Tools", and "Help". The main interface is divided into several sections:

- Radio Modules:** A list of modules with details for the selected one:
 - Name: (blank)
 - Function: XBEE WI-FI
 - Port: COM9 - 9600/8/N/1/N - AT
 - MAC: 00000004F31D8209
- Radio Configuration [- 00000004F31D8209]:** A settings panel with a toolbar containing "Read", "Write", "Default", "Update", and "Profile" buttons. A search box labeled "Parameter" is also present.
- Network:** A section titled "Change Network Settings" containing a list of parameters:
 - AH Network type: Infrastructure [2]
 - CE Infrastructure Mode: STA mode [2]
 - ID SSID: edtpnet
 - EE Encryption Enable: WPA2 (AES) security [2]
 - PK Passphrase: passphrase
 - IP IP Protocol: UDP [0]
 - MA IP Addressing Mode: DHCP [0]
 - TM TCP Client Co...ction Timeout: 64 * 100 ms
 - TS TCP Server Co...ction Timeout: 258 * 100 ms
 - DO Device Options: 3
 - EQ Device Cloud FQDN: devicecloud.digi.com
- Addressing:** A section titled "Change Addressing Settings" containing:
 - SH Serial Number High: 4
 - SL Serial Number Low: F31D8209

XBee Radio Modules

Addressing

The screenshot displays the XCTU (Xbee Configuration Test Utility) software interface. The window title is "XCTU" and the menu bar includes "XCTU", "Working Modes", "Tools", and "Help". The main interface is divided into several sections:

- Radio Modules:** A list of modules with details for the selected one: Name, Function (XBEE WI-FI), Port (COM9 - 9600/8/N/1/N - AT), and MAC (00000004F31D8209).
- Radio Configuration [- 00000004F31D8209]:** A settings panel with a toolbar containing "Read", "Write", "Default", "Update", and "Profile" buttons. A search box labeled "Parameter" is also present.
- Addressing:** A section titled "Change Addressing Settings" containing a list of parameters for configuration:

Parameter	Value
SH Serial Number High	4
SL Serial Number Low	F31D8209
NS DNS Address	192.168.1.1
DL Destination IP Address	192.168.1.161
NI Node Identifier	
KP Device Cloud Description	
KC Device Cloud Contact	
KL Device Cloud Location	
CO Source Port	2616
DE Destination Port	2616
GW IP Address of gateway	192.168.1.1
MK IP Address Mask	255.255.255.0
MY Module IP Address	192.168.1.152
- Serial Interfacing:** A section titled "Change module interfacing options" with a dropdown menu for "RD Baud Rate" set to "9600 (31)".

XBee Radio Modules

DIO Configuration

Radio Modules

Name:
Function: XBEE WI-FI
Port: COM9 - 9600/8/N/1/N - AT
MAC: 00000004F31D8209

Radio Configuration [- 00000004F31D8209]

Read Write Default Update Profile

Parameter

Modify DIO and ADC Options

D0	DIO0/AD0	Digital Input [3]
D1	DIO1/AD1/SPI_ATTN	Digital Out, Low [4]
D2	DIO2/AD2/SPI_SCLK	Digital Out, Low [4]
D3	DIO3/AD3/SPI_SSEL	Digital Out, Low [4]
D4	DIO4/SPI_MOSI	Digital Out, Low [4]
D5	DIO5/ASSOCIATED_INDICATOR	Assoc. Indicator [1]
D6	DIO6/RTS	Digital Out, Low [4]
D7	DIO7/CTS	RS-485 Enable, Low [6]
D8	DIO8/SLEEP_REQUEST	Digital Out, Low [4]
D9	DIO9/ON_SLEEP	ON/SLEEP Output [1]
P0	DIO10/RSSI/PWM0	Digital Out, Low [4]
P1	DIO11/PWM1	Digital Out, Low [4]
P2	DIO12/SPI_MISO	Digital Out, Low [4]
P3	DIO13/DOUT	UART DOUT [1]
P4	DIO14/DIN	UART DIN [1]
PD	Pull Direction	7FFF

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XBee Radio Modules

Coding the Android App

Sub Process_Globals

'These global variables will be declared once when the application starts.

'These variables can be accessed from all modules.

```
Dim usocket As UDP Socket
```

```
Dim upacket As UDPPacket
```

```
Dim upktData(64) As Byte
```

```
End Sub
```

Sub Globals

'These global variables will be redeclared each time the activity is created.

'These variables can only be accessed from this module.

```
Private bConnected As Boolean
```

```
Private btnSend As Button
```

```
Private etStatus As EditText
```

```
End Sub
```



XBee Radio Modules

Coding the Android App

```
Sub Activity_Create(FirstTime As Boolean)
```

```
Activity.LoadLayout("Layout1")
```

```
Activity.Title="XBee On Your Phone"
```

```
usocket.Initialize("UDP", 9750, 1024)
```

```
bConnected = usocket.IsInitialized
```

```
If bConnected = True Then
```

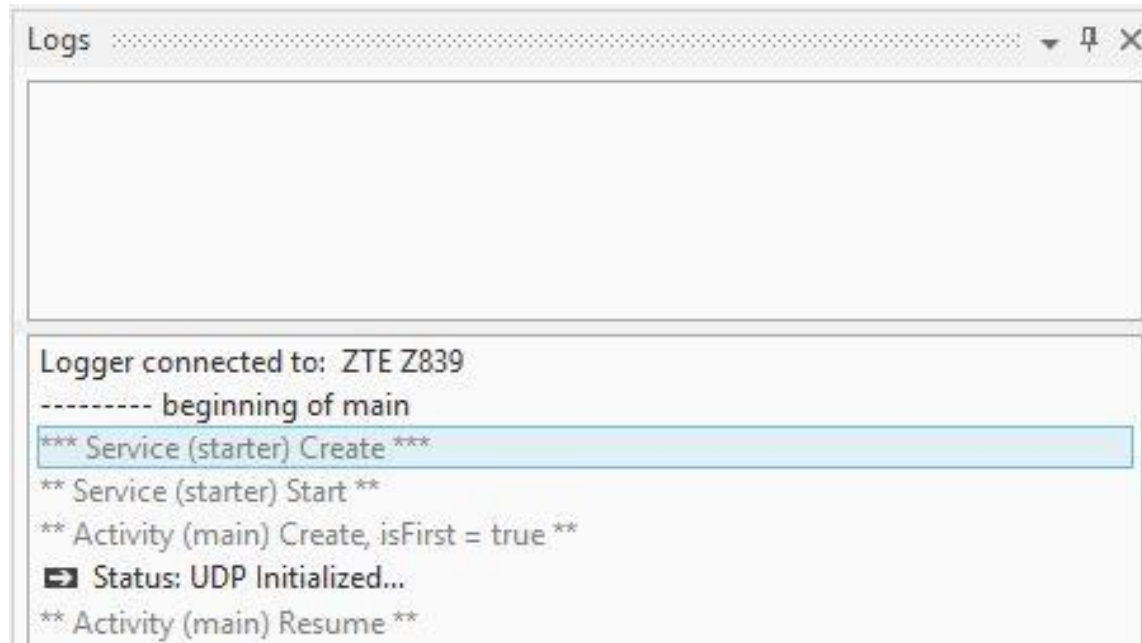
```
Log("Status: UDP Initialized...")
```

```
Else
```

```
Log("Status: UDP Error...")
```

```
End If
```

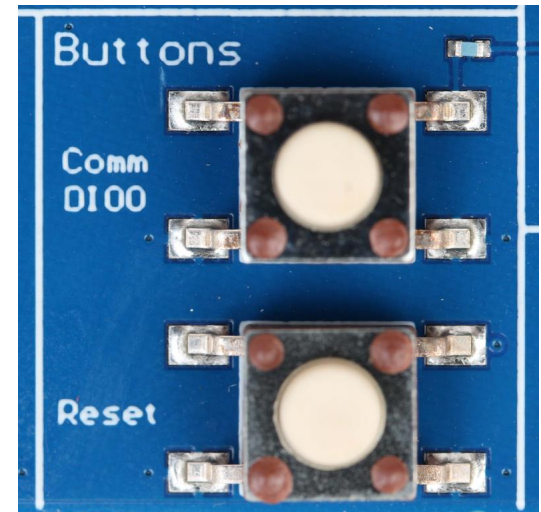
```
End Sub
```



XBee Radio Modules

Coding the Android App

```
Sub UDP_PacketArrived (Packet As UDPPacket)
  upktData = Packet.Data
  If upktData(17) = 0x00 Then
    etStatus.Text = " Switch Closed"
  Else
    etStatus.Text = " Switch Open"
  End If
End Sub
```



Presented by:



XBee Radio Modules

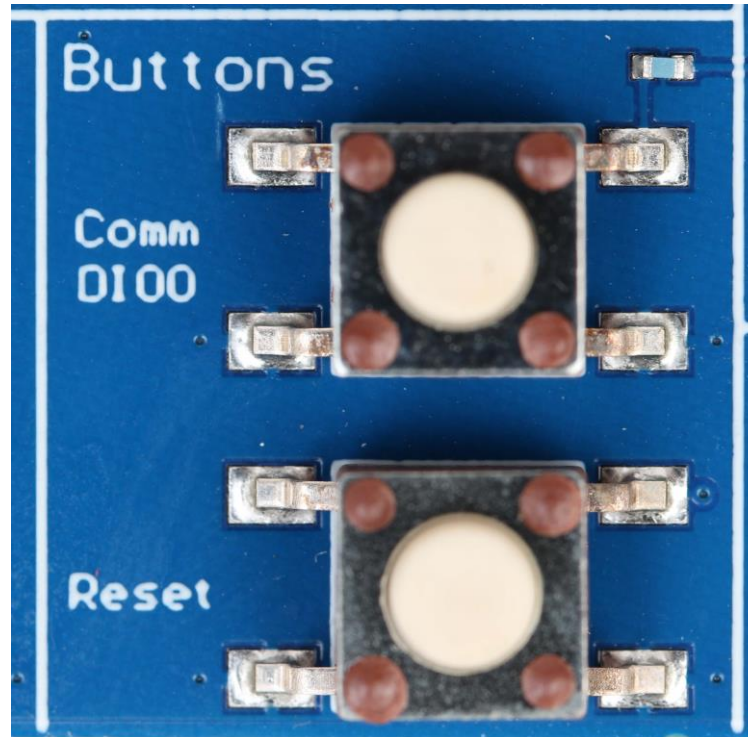
Coding the Android App

OPEN

CLOSED

Watch:

Name	
upktData	
0...99	
0	66 (0x42)
1	66 (0x42)
2	0 (0x0)
3	0 (0x0)
4	0 (0x0)
5	0 (0x0)
6	-126 (0xFFFFF82)
7	0 (0x0)
8	1 (0x1)
9	73 (0x49)
10	83 (0x53)
11	0 (0x0)
12	1 (0x1)
13	29 (0x1D)
14	95 (0x5F)
15	0 (0x0)
16	0 (0x0)
17	1 (0x1)
18	0 (0x0)
19	0 (0x0)
20	0 (0x0)



Watch:

Name	
upktData	
0...99	
0	66 (0x42)
1	66 (0x42)
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14	95 (0x5F)
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16	0 (0x0)
17	0 (0x0)
18	0 (0x0)
19	0 (0x0)
20	0 (0x0)



XBee Radio Modules

Coding the Android App

Sub btnSend_Click

upktData(0) = 0x42'random number 0x4242 - Number 1

upktData(1) = 0x42

upktData(2) = 0x00'random number ^ 0x4242 - Number 2

upktData(3) = 0x00

upktData(4) = 0x00'reserved

upktData(5) = 0x00'encryption pad

upktData(6) = 0x02'payload contains a remote AT command

upktData(7) = 0x00'no options for this command - end of header

upktData(8) = 0x01'frame ID

upktData(9) = 0x02'apply changes to all commands

upktData(10) = 0x49'IAT command

upktData(11) = 0x53'S

upacket.Initialize2(upktData, 0, 12, "192.168.1.152", 3054)

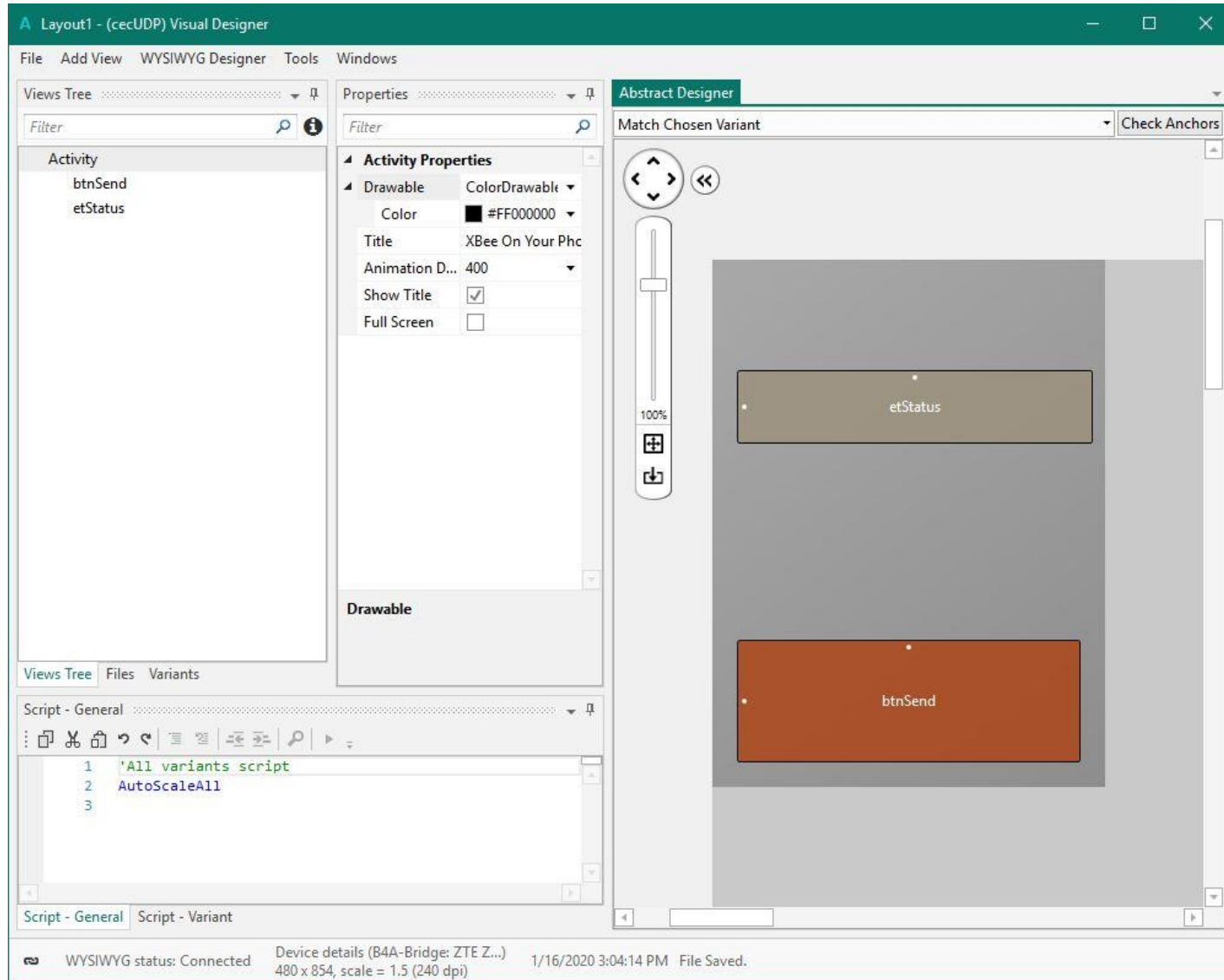
usocket.Send(upacket)

End Sub



XBee Radio Modules

Coding the Android App



Presented by:

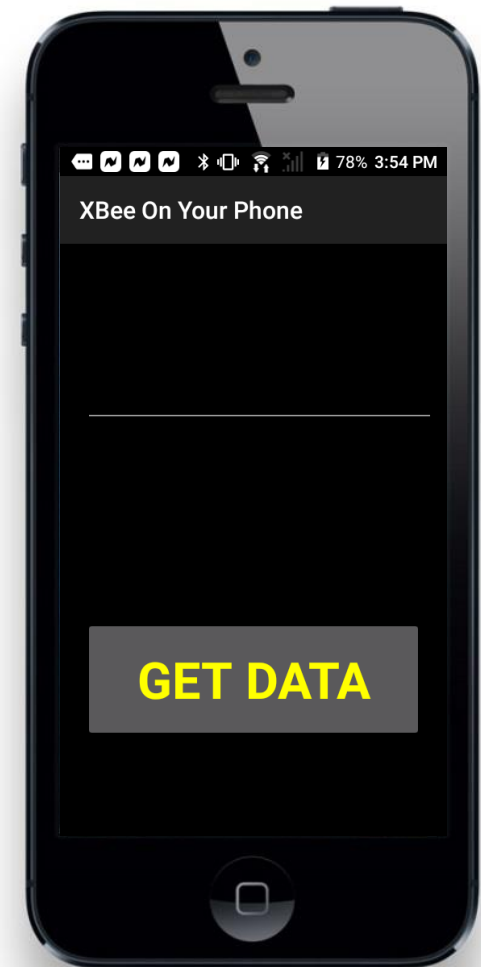


XBee Radio Modules

Coding the Android App

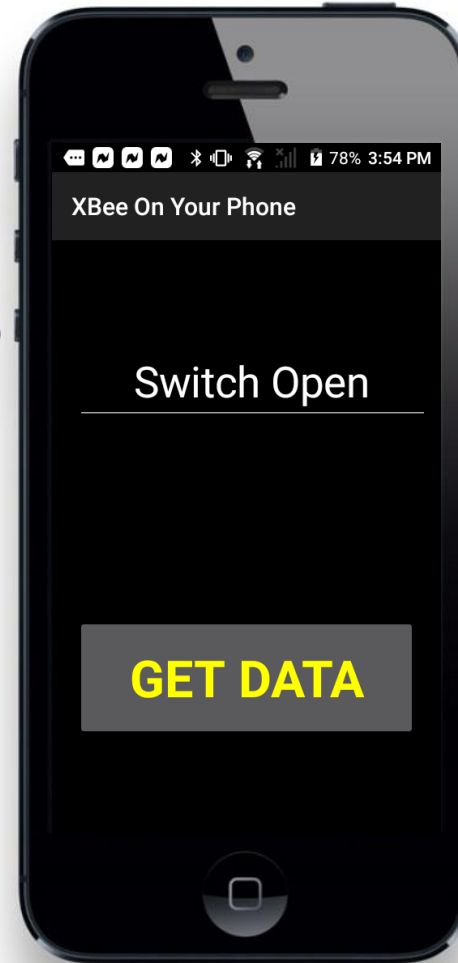
Sub btnSend_Click

```
upktData(0) = 0x42'random number 0x4242 - Number 1
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upktData(3) = 0x00
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XBee Radio Modules

Coding the Android App



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20	0 (0x0)

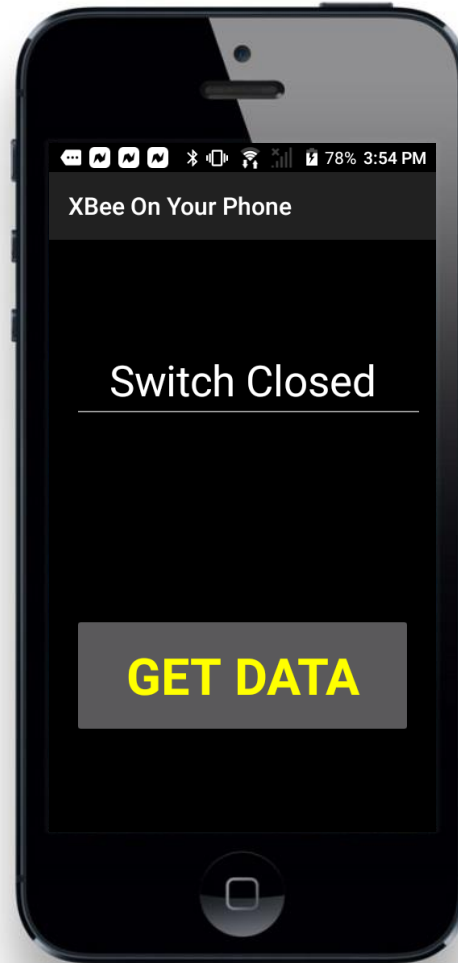
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Else
etStatus.Text = " Switch Open"
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```



XBee Radio Modules

Coding the Android App

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XBee Radio Modules

Day 5 Summary

