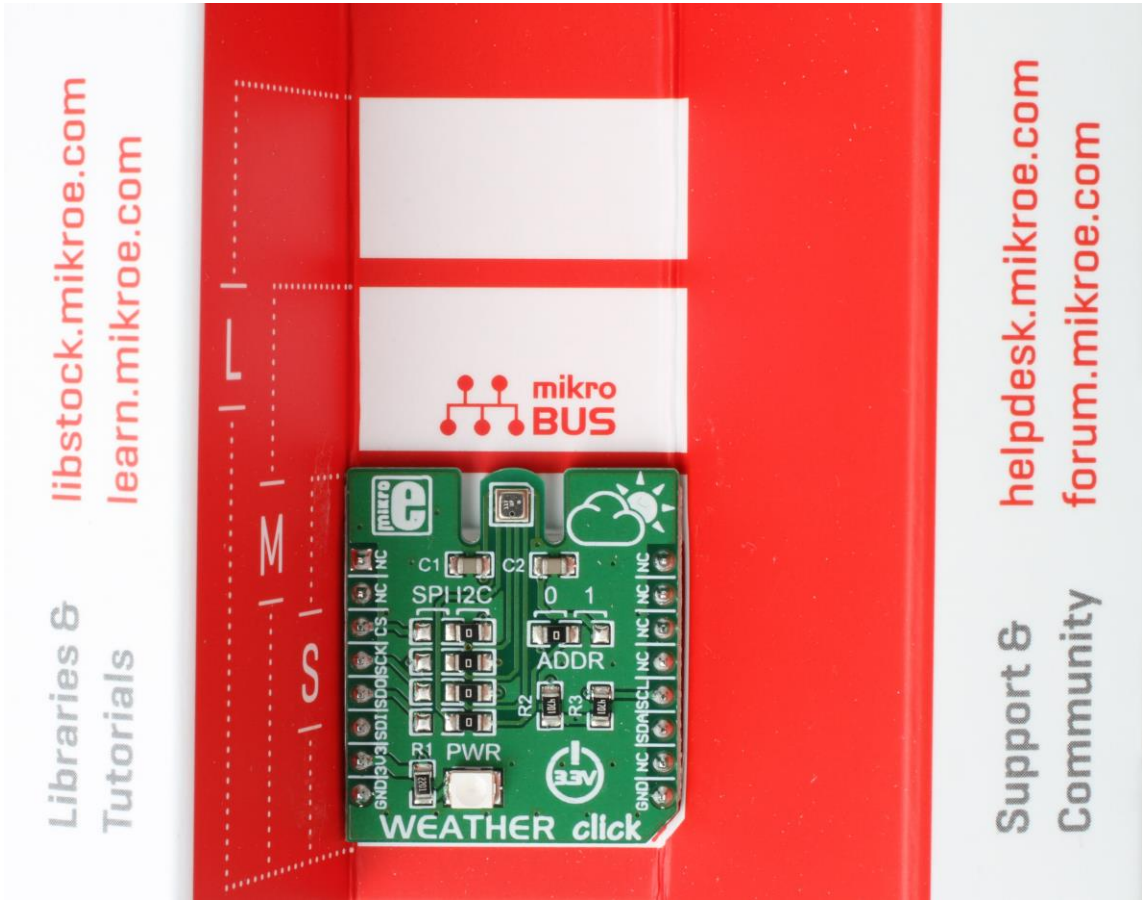
IoT Development Tools for PIC32



EasyPIC Fusion v7

February 1, 2018

FRED EADY

Presented by:

DesignNews

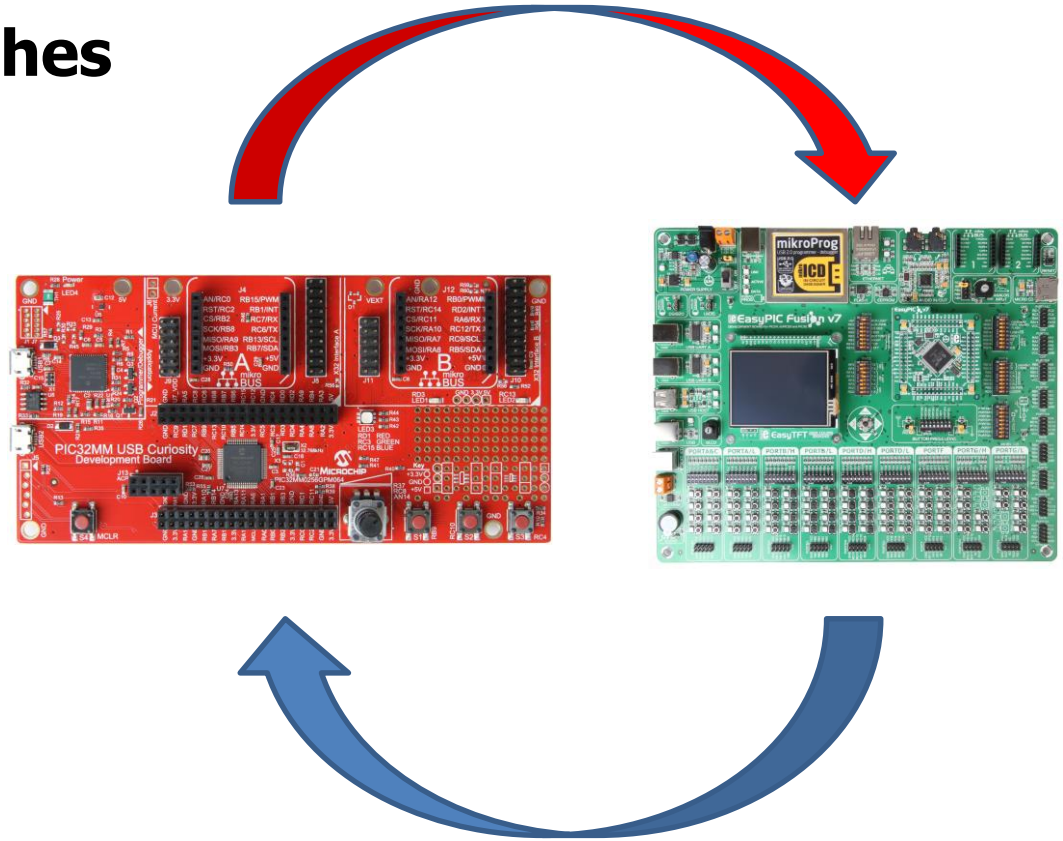
CEC CONTINUING EDUCATION CENTER

Digi-Key ELECTRONICS

IoT Development Tools for PIC32

AGENDA

- Hardware
- Bluetooth and a PIC32MM USB Curiosity
- The Weather at 6
- Buenas Noches



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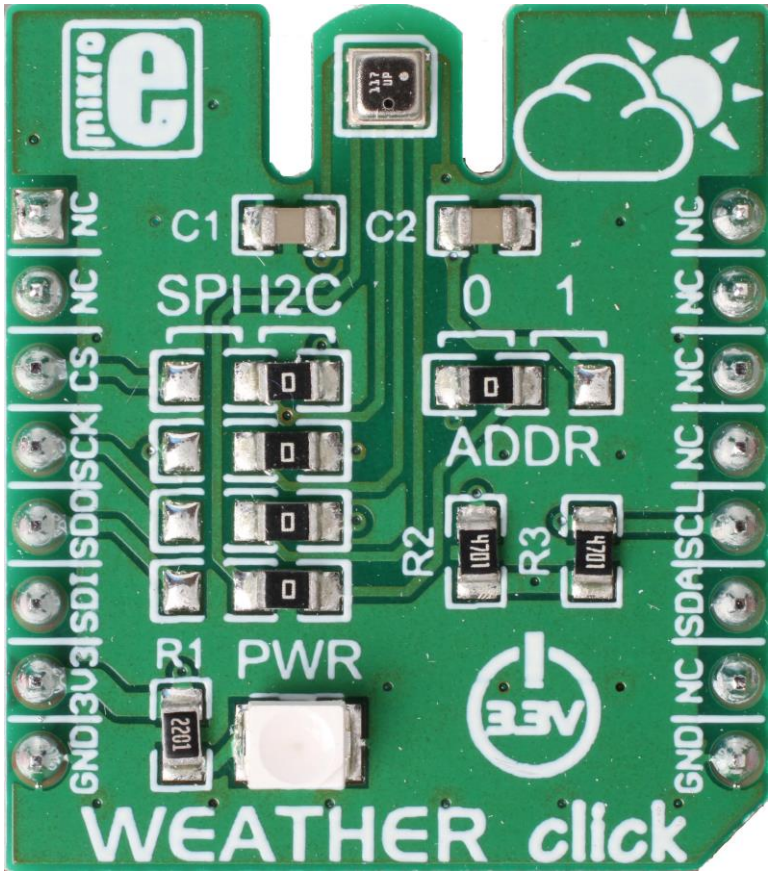
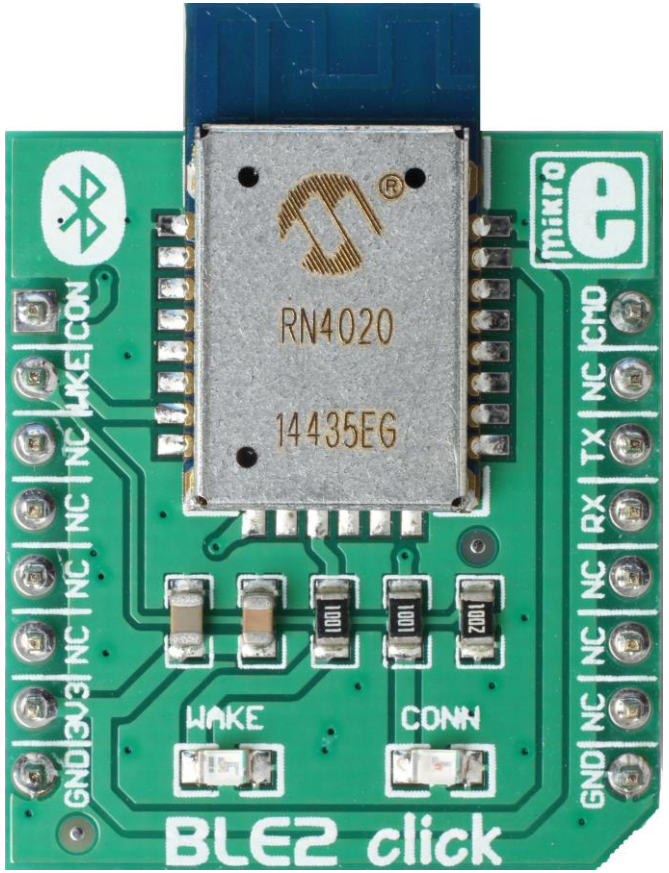
Hardware – click Part Numbers



WEATHER BOARD HUM/PRESS/TEMP
MIKROE-1978
1471-1487-ND



RF TXRX BLUETOOTH TRACE ANT
MIKROE-1715
1471-1452-ND

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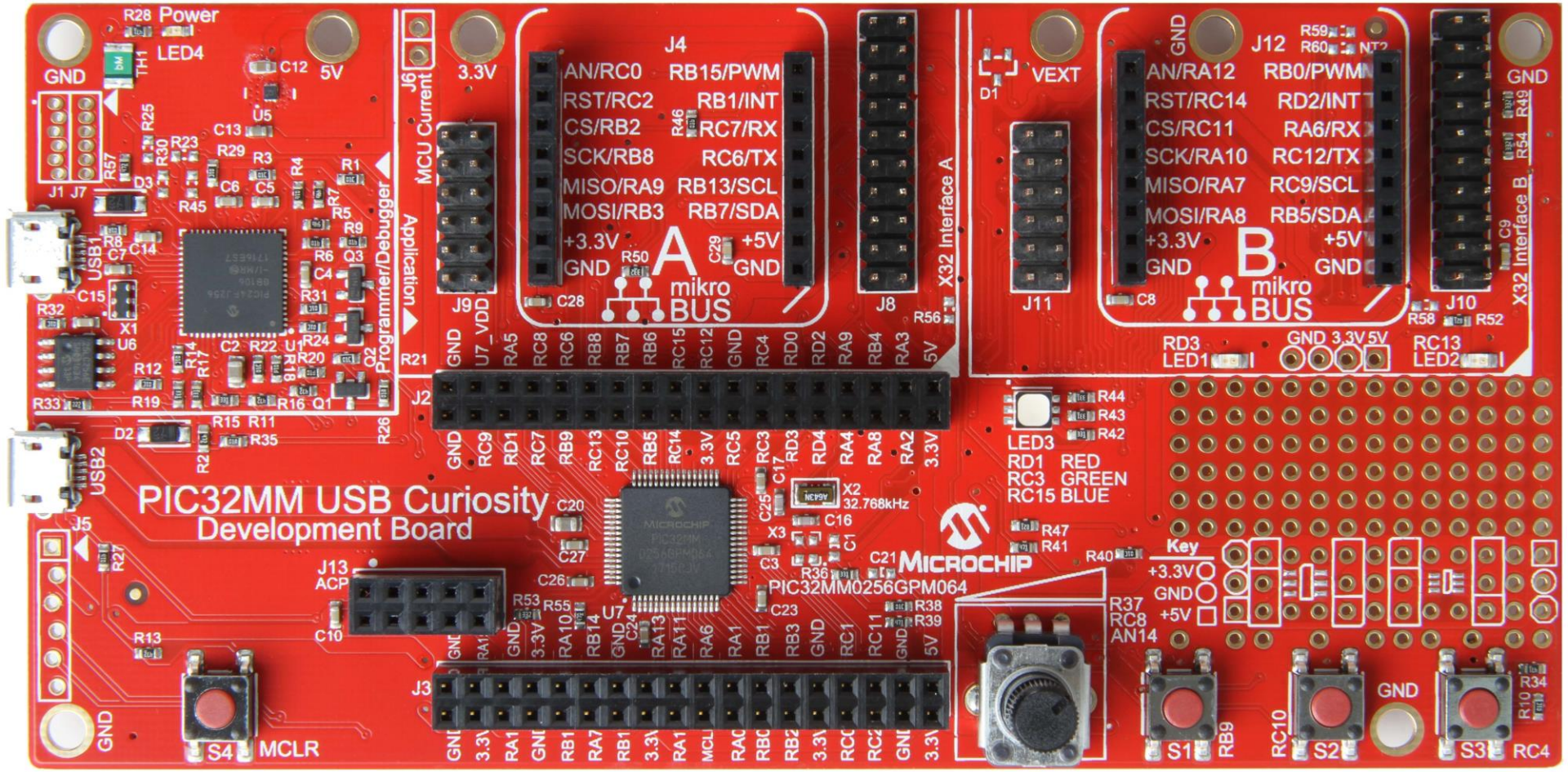
Hardware – PIC32MM USB Curiosity



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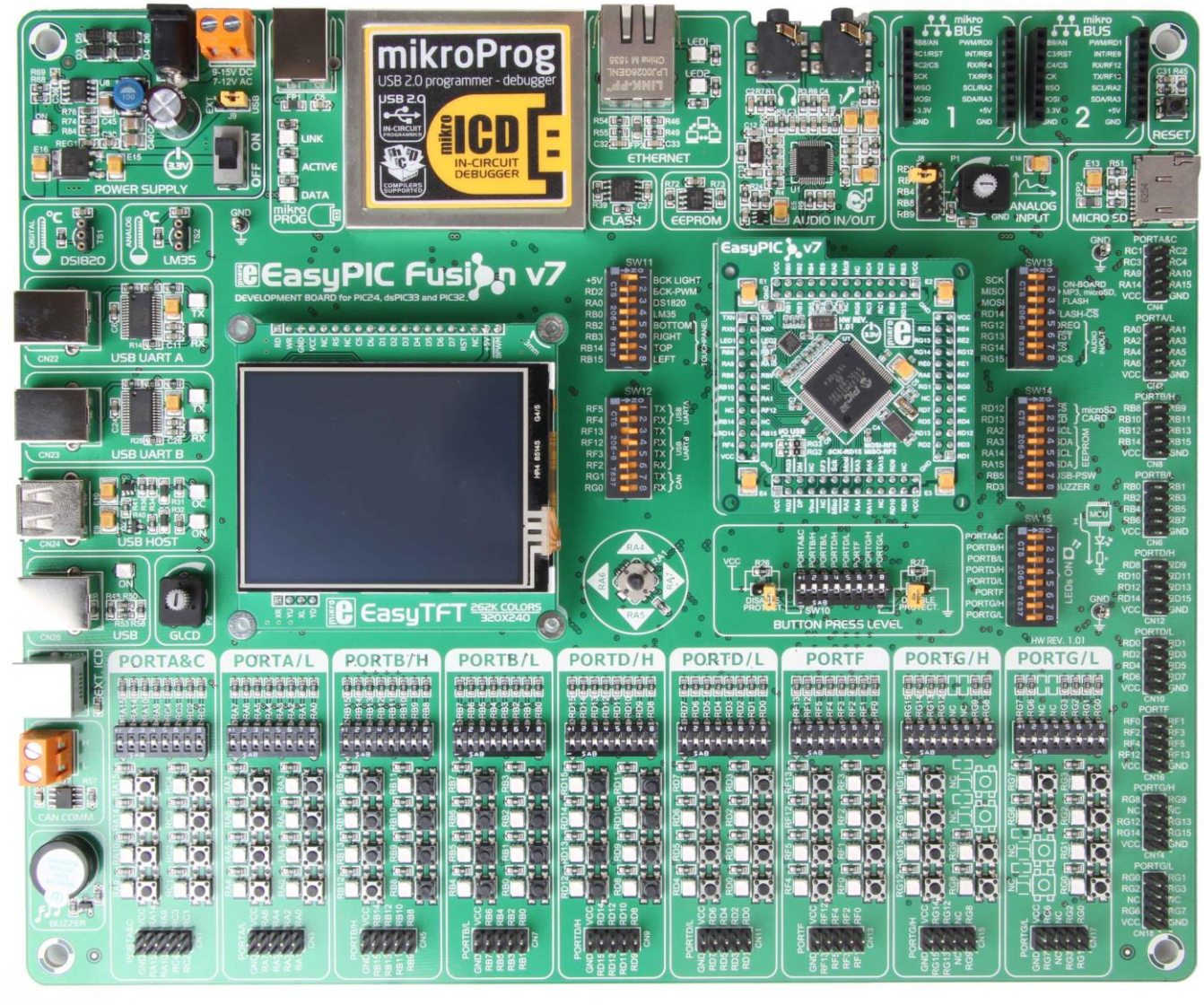
Hardware – EasyPIC Fusion v7



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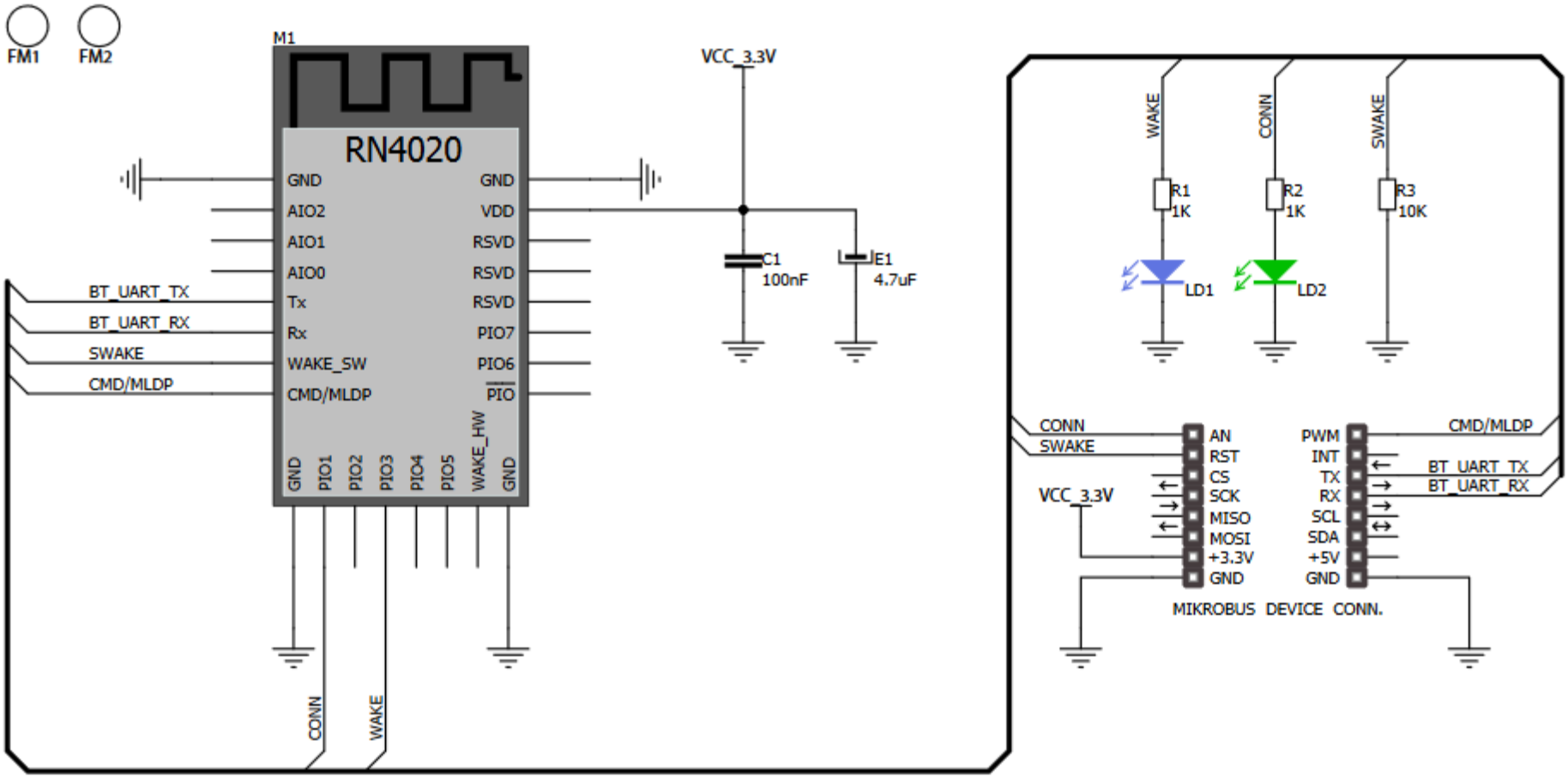
Bluetooth and a PIC32MM USB Curiosity



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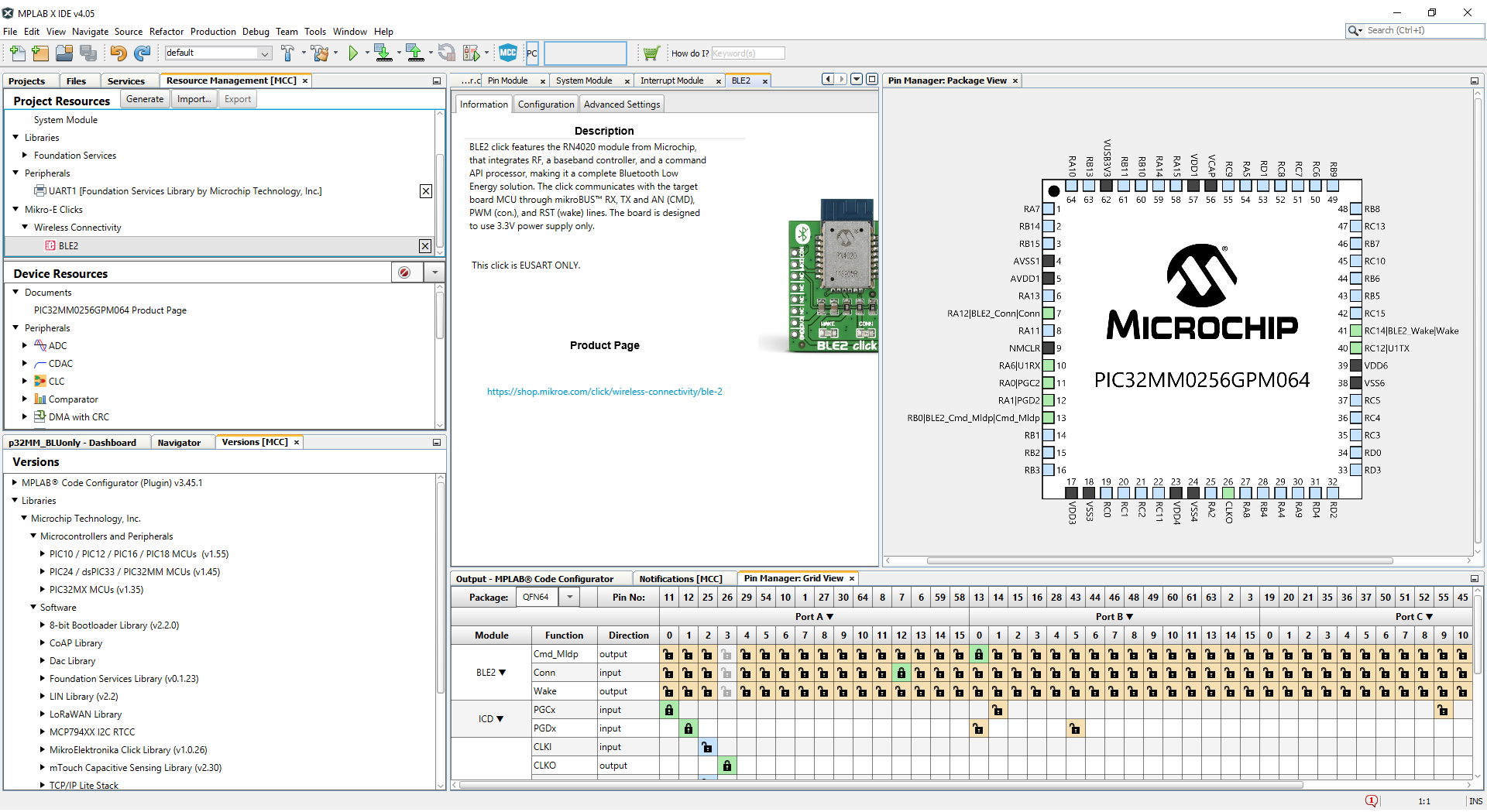
Bluetooth and a PIC32MM USB Curiosity



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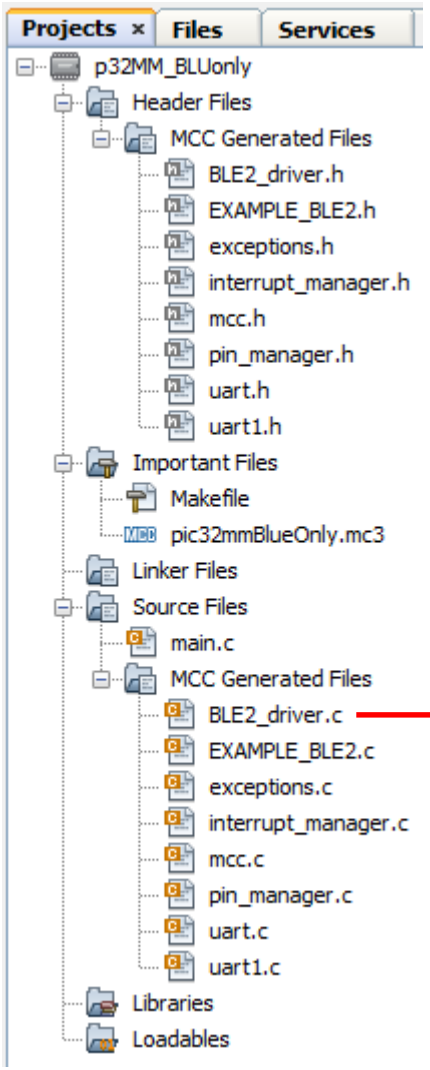
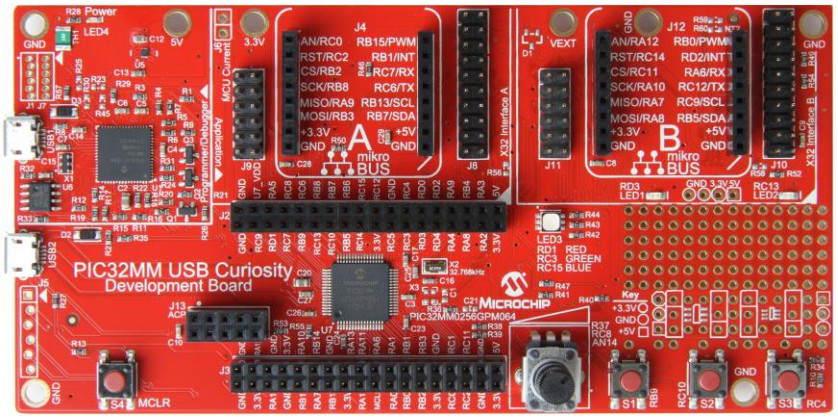
Bluetooth and a PIC32MM USB Curiosity

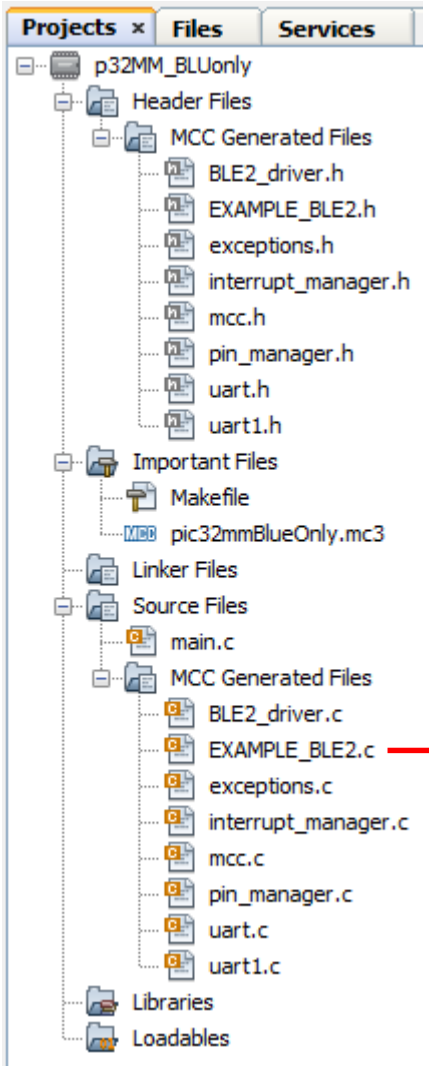





```
52 void BLE2_SendBuffer(uint8_t *buffer, uint8_t length)
53 {
54     while(length--)
55         BLE2_SendByte(*buffer++);
56 }
57 void BLE2_SendByte(uint8_t byte)
58 {
59     uart[BLE2].Write(byte);
60 }
```

IoT Development Tools for PIC32

Bluetooth and a PIC32MM USB Curiosity




```
85  void EXAMPLE_setupBLE2 (const char* name)
86  {
87      char* exampleRead;
88      uart[BLE2].SetRxISR(EXAMPLE_CaptureReceivedMessage);
89      BLE2_WakeModule();                          // Wake Module using GPIO
90      EXAMPLE_blockingWait(200);                  // Wait for "CMD" Response
91      exampleRead = EXAMPLE_GetResponse();        // Read "CMD\r\n" from Buffer
92      strcpy(exampleReadStorage, exampleRead);    // Store for use/reference
93      EXAMPLE_ReadyReceiveBuffer();               // Prepare for next message
94      BLE2_EnterCommand_Mode();                   // Enter "Command Mode" via GPIO
95      EXAMPLE_sendAndWait("SF,1\r\n");            // Factory Reset
96      EXAMPLE_sendAndWait("SR,30000800\r\n");     // Setup Services
97      BLE2_SendString("S-,");                     // Set Serialized Name
98      BLE2_SendString(name);
99      EXAMPLE_sendAndWait("\r\n");
100     BLE2_SendString("SN,");                     // Set Name
101     BLE2_SendString(name);
102     EXAMPLE_sendAndWait("\r\n");
103     EXAMPLE_sendAndWait("A\r\n");               // Advertise
104     EXAMPLE_sendAndWait("R,1\r\n");             // Reset
105     EXAMPLE_blockingWait(120);
106     BLE2_EnterCommand_Mode();                   // Enter "Command Mode" via GPIO
107     EXAMPLE_sendAndWait("B\r\n");               // Bond
108     EXAMPLE_sendAndWait("WC\r\n");              // Clear Scripts
109 }
```

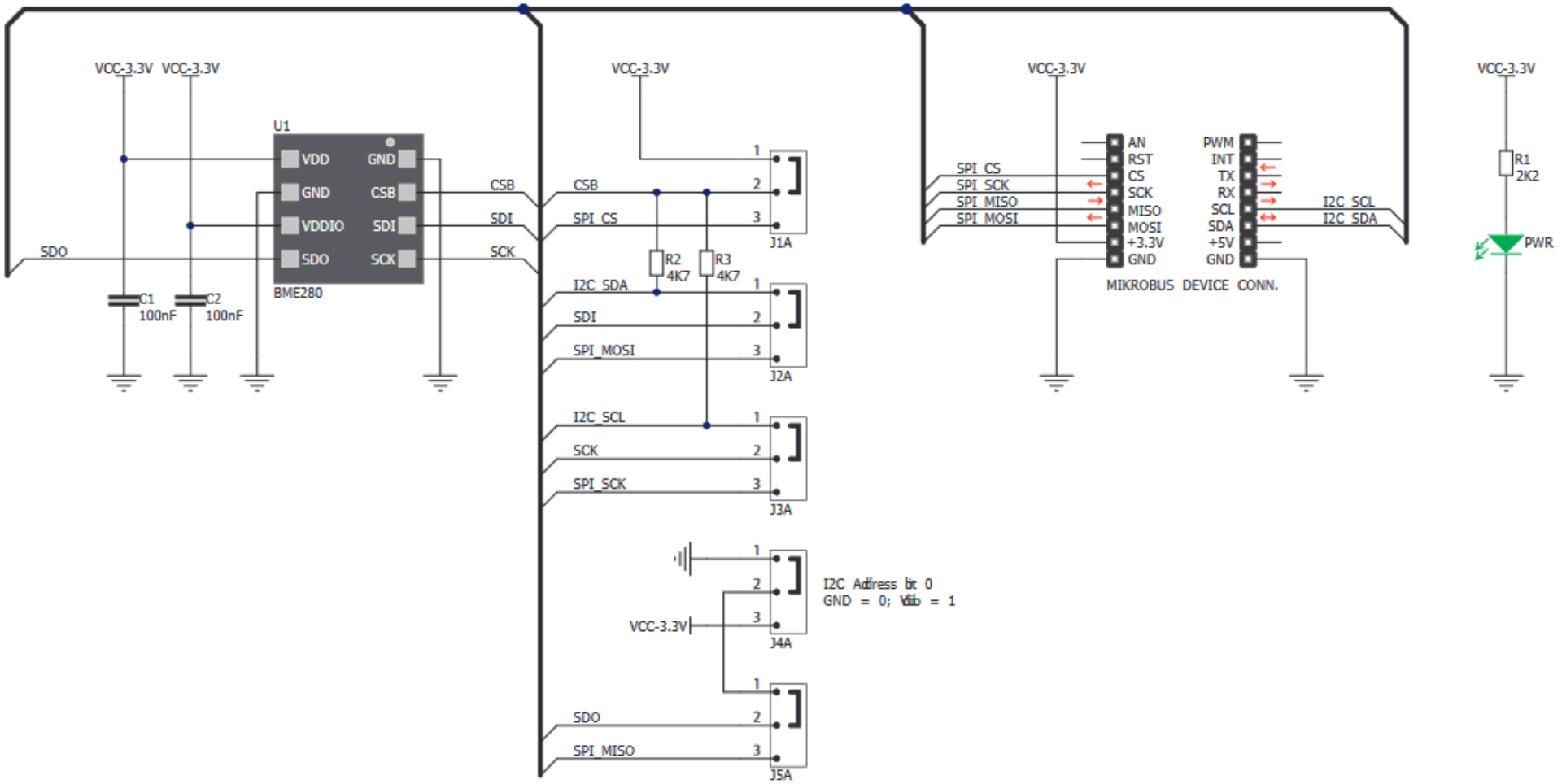
IoT Development Tools for PIC32

Bluetooth and a PIC32MM USB Curiosity

```
uint8_t message[6] = {"Freddy"};
int main(void)
{
    // initialize the device
    SYSTEM_Initialize();

    // When using interrupts, you need to set the Global Interrupt Enable bits
    // Use the following macros to:

    // Enable the Global Interrupts
    INTERRUPT_GlobalEnable();

    // Disable the Global Interrupts
    //INTERRUPT_GlobalDisable();
    EXAMPLE_setupBLE2 ("Blue");
    while (1)
    {
        // Add your application code
         EXAMPLE_sendMessageOverBLE2(message);
         ctDelayms(1000);
    }
}
```

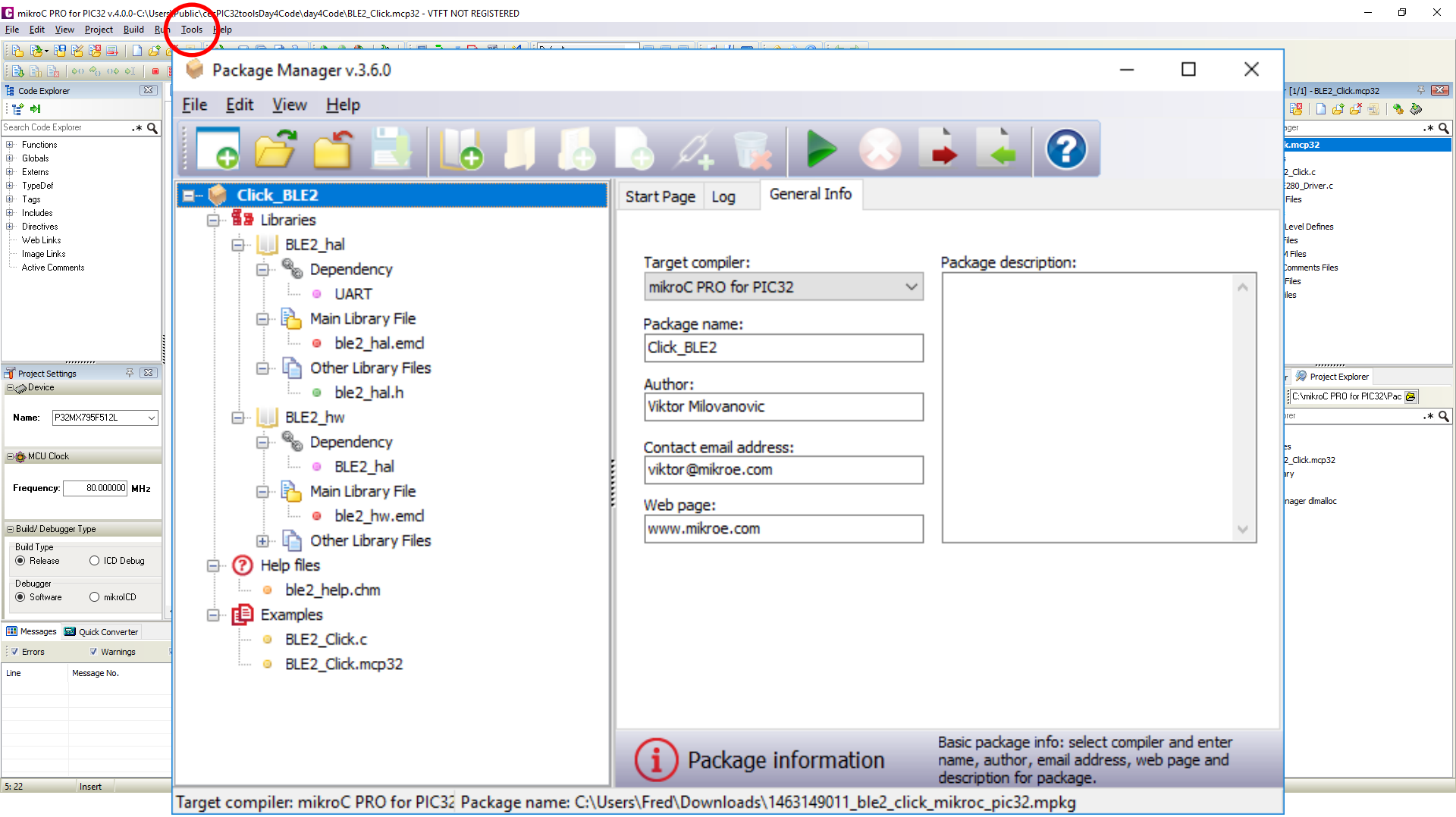
IoT Development Tools for PIC32

The Weather at 6



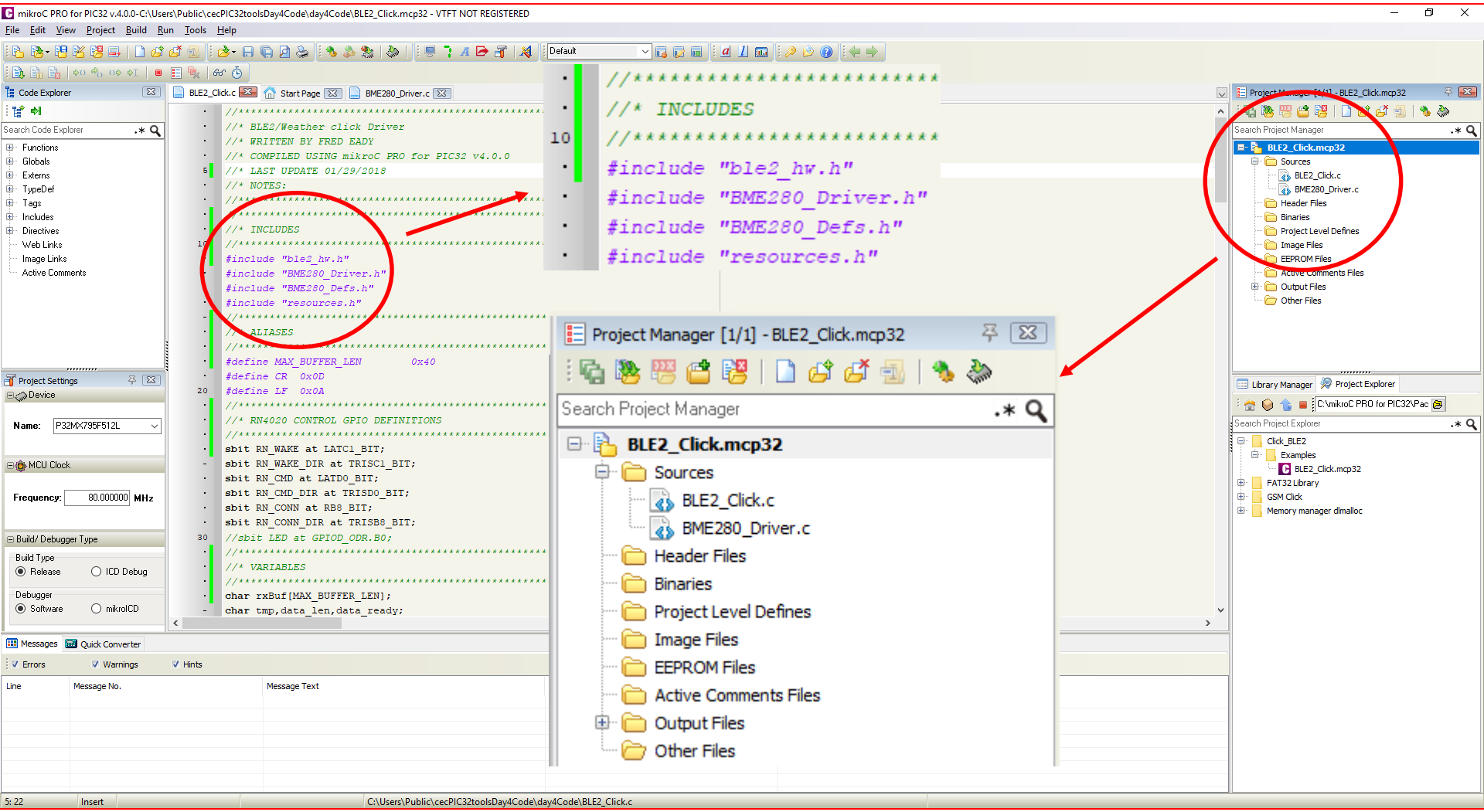
IoT Development Tools for PIC32

The Weather at 6



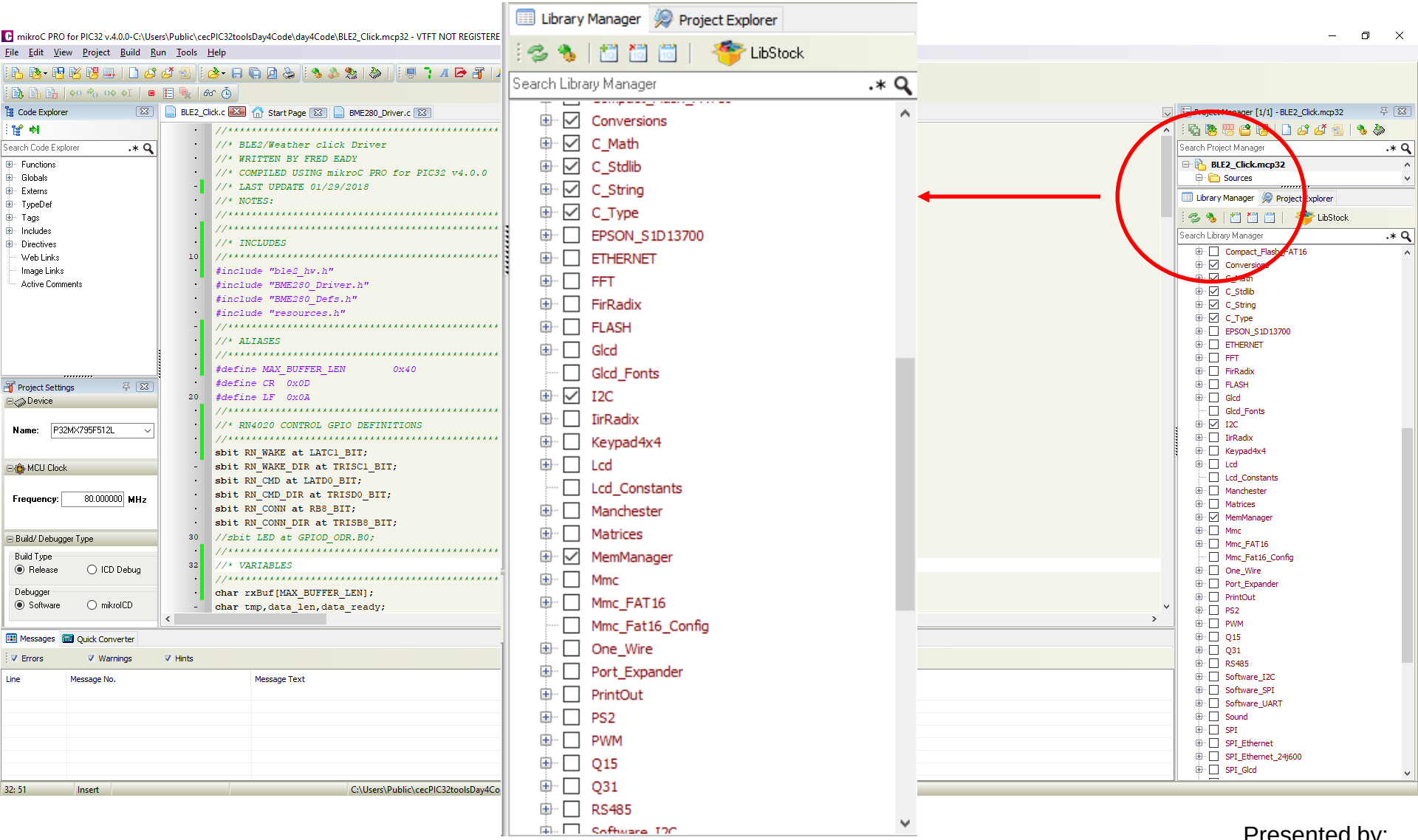
IoT Development Tools for PIC32

The Weather at 6



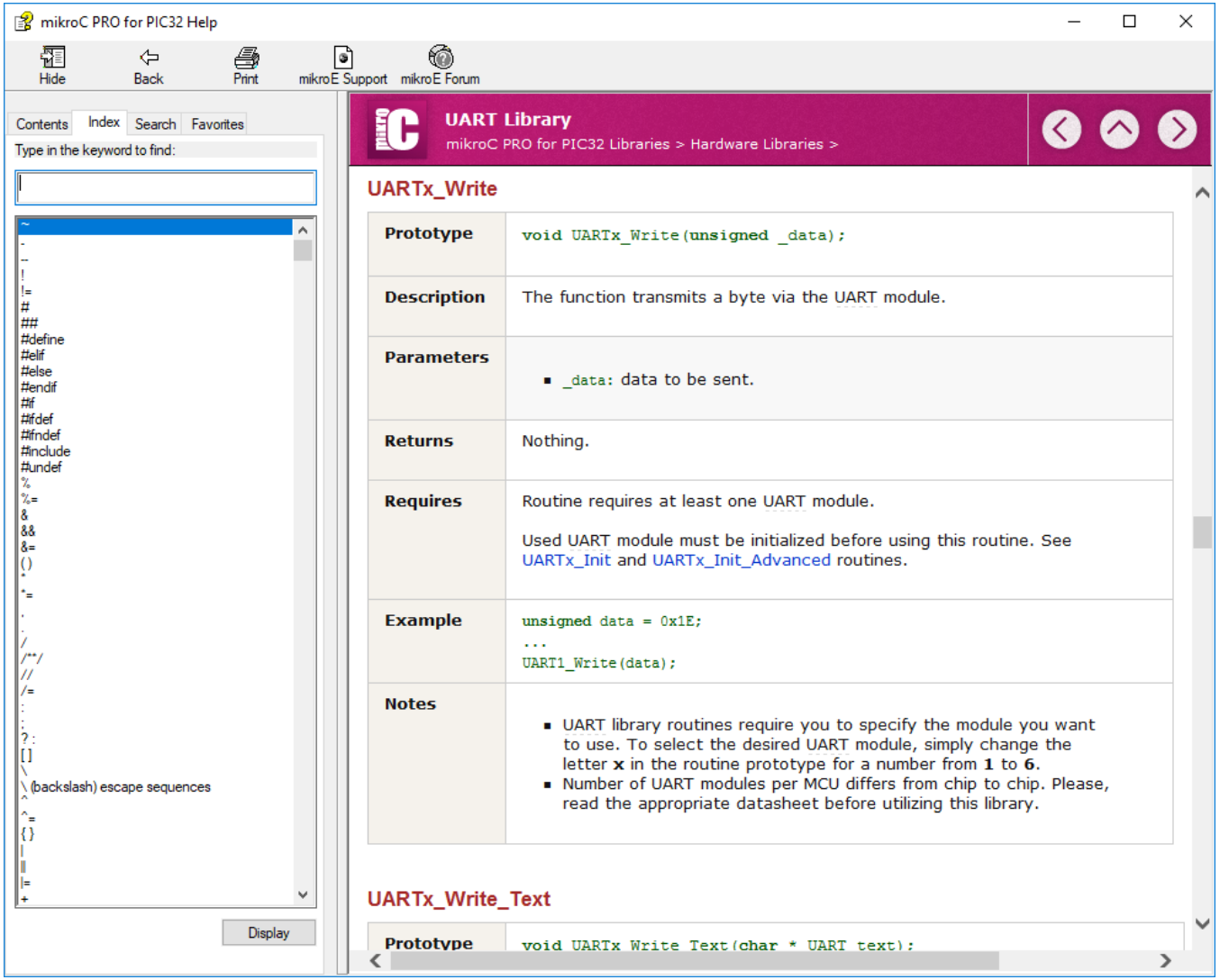
IoT Development Tools for PIC32

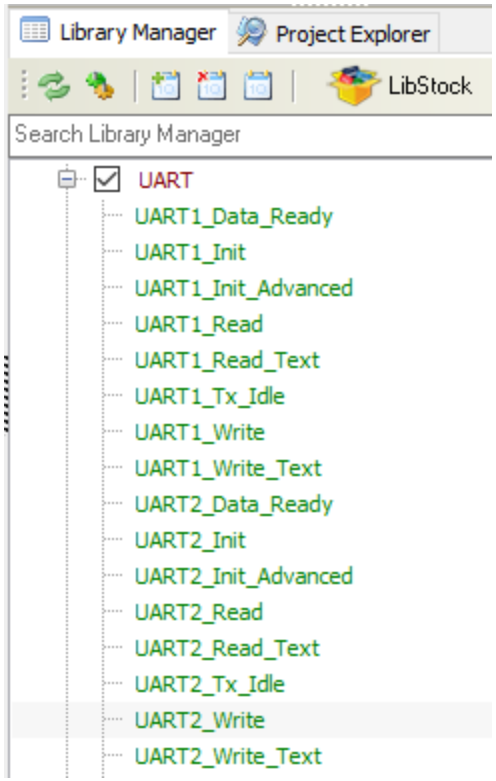
The Weather at 6



IoT Development Tools for PIC32

The Weather at 6





IoT Development Tools for PIC32

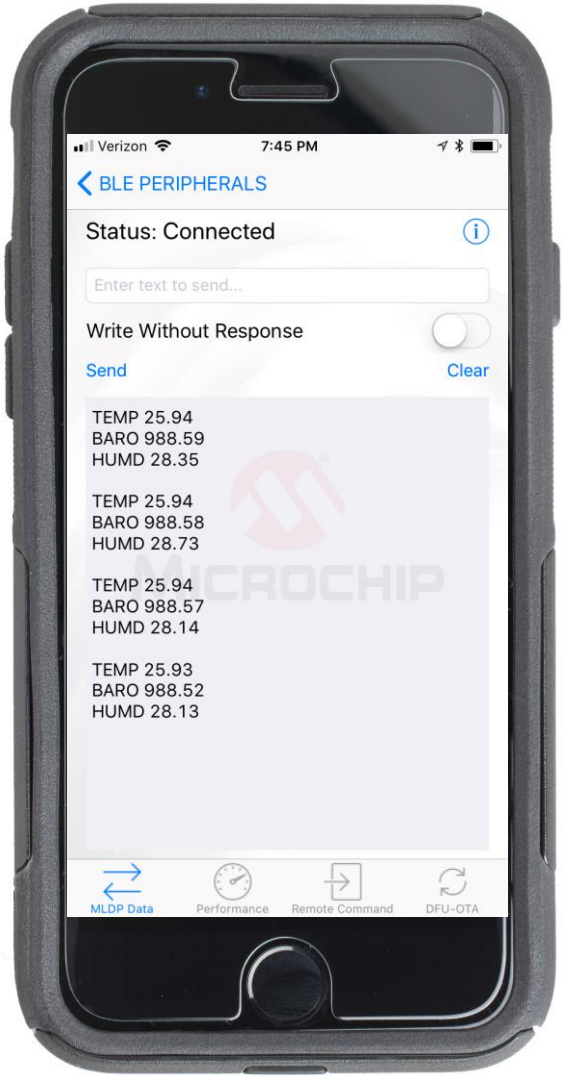
The Weather at 6

```
//*****************************************************************************
//* INITIALIZE RN4020
//*****************************************************************************
void BLE_Init()
{
  RN_WAKE = 1;
  while (!wait_response("CMD"));          //Wait to response CMD
  ble2_reset_to_factory_default(1);       //Reset RN4020 to factory settings
  while (!wait_response("AOK"));          //Wait to response AOK
  ble2_set_device_name("BLE2_Click");     //Set name BLE2_Click
  while (!wait_response("AOK"));          //Wait to response AOK
  ble2_set_supported_features(30000800); //Auto Advertise (Table: 2-5 in Datas
  while (!wait_response("AOK"));          //wait to response AOK
  ble2_device_reboot();                   //reboot
  while (!wait_response("Reboot"));       //wait to response Reboot
  ble2_bond(1);
  ble2_clear_script();
}
```

IoT Development Tools for PIC32

The Weather at 6

```
    do{
        while(BME280_IsMeasuring());
        BME280_ReadMeasurements();
        tmp_f = BME280_GetTemperature();
        sprintf(txBuf, "TEMP %.2f", tmp_f);
        BLE2_SendBuffer(txBuf, sizeof(txBuf));
        BLE2_SendByte(CR);
        BLE2_SendByte(LF);
180     tmp_f = BME280_GetPressure();
        sprintf(txBuf, "BARO %.2f", tmp_f);
        BLE2_SendBuffer(txBuf, sizeof(txBuf));
        BLE2_SendByte(CR);
        BLE2_SendByte(LF);
        tmp_f = BME280_GetHumidity();
        sprintf(txBuf, "HUMD %.2f", tmp_f);
        BLE2_SendBuffer(txBuf, sizeof(txBuf));
        BLE2_SendByte(CR);
        BLE2_SendByte(LF);
190     BLE2_SendByte(CR);
        BLE2_SendByte(LF);
    BME280_INIT();
    delay_ms(1500);
    }while(1);
```



IoT Development Tools for PIC32
Buenas Noches