GPRS Modem Demo

TN-006

Cybrotech Ltd
14 Brinell Way, Harfreys Industrial Estate
Great Yarmouth, Norfolk, Nr31 OLU - UK
tel: +44 (0)1493 650 222
www.cybrotech.co.uk
info@cybrotech.co.uk

Index

Index 1
Introduction 2
Requirements 2
Configuring modem 3
GPRSModem.cyp 7
Functionality 9
Including subroutine to custom project 11
Additional documents and sources 12
Included files 12

Introduction

This document explains GPRS Modem Demo project and shows how to incorporate this subroutine in your application.

Requirements

To setup the modem you'll need:

- GSM (GPRS) Modem GM-29
- Power supply for modem
- SIM card
- RS-232 cable
- PC with any Terminal software (e.g. HyperTerminal)

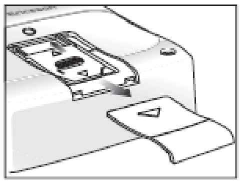
To use modem with a CyBro-2 you'll also need:

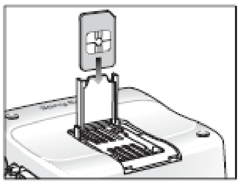
- CyBro-2
- Programming cable (ORDER CODE: CAD-PP-P2)
- GSM modem cable (ORDER CODE: CAD-GSM02-P2)
- CyPro development software installed[1]

[1] Available for download at http://www.cybrotech.co.uk/index.php?lang=en&module=file&path=/Software

Configuring modem

Modem must use standard AT commands for control. After each command processed successfully modem responds with **OK**.





1. Insert SIM card into the modem.
2. Connect antenna to the modem.
3. Connect the power to the modem.
4. Connect the modem with PC (use RS-232 cable)
5. Open a terminal window (e.g. HyperTerminal in Windows).
6. Make a new connection and set the corresponding COM port (e.g. COM1), baud rate 9600, 8 data bits, 1 stop bit, hardware handshaking (Figure 1)

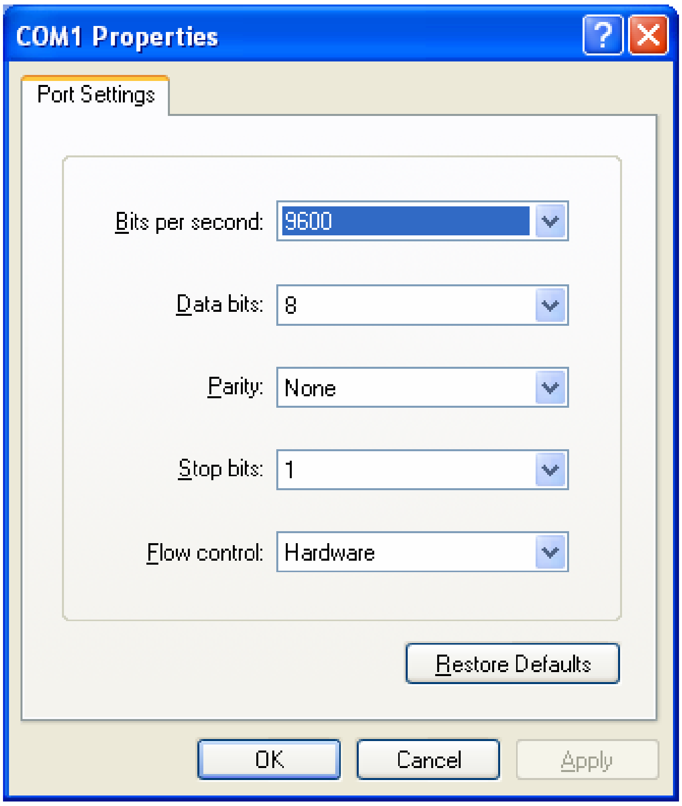


Figure 1: HyperTerminal port settings.

7. Establish a connection to modem.
8. Send: ***AT*** (type in terminal window and press ENTER).
   If connection is set up correctly modem will respond whit OK otherwise repeat steps 1. through 6.

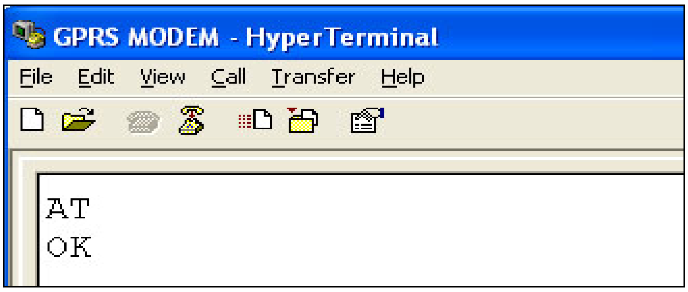


Figure 2: Modem's response to command ***AT***.

9. Send: ***AT+CPIN="xxxx"***
   xxxx = PIN number of SIM card (e.g. AT+CPIN="1234")
   You have three tries if entering an incorrect PIN number before PUK number is required.
10. Send: ***AT+CLCK="SC",0,"xxxx"***
    xxxx = PIN number of SIM card (e.g. AT+CLCK="SC",0,"1234")
    Unlocks SIM card permanently. Entering PIN number on power-up is no longer required.
11. Send: ***AT+IPR=19200***
    Sets baud rate of the modem to 19200 bits/sec.
12. Set HyperTerminal's baud rate to 19200.
13. Send: ***AT+IFC=0***
    Sets hardware flow control to NONE.
14. Send: ***AT+CNMI=2,1,0,0***
    Sets how new SMS will be shown to CyBro-2. (When receiving new SMS modem will send notification e.g. **+CMTI: "SM",3**)
15. Send: ***AT+CSCA="+xxxx"***
    +xxxxx = your service provider's SMS center number
    (e.g. ***AT+CSCA="+38641001333"***)
16. Send: ***AT+CMGF=1***
    SMS are sent to CyBro in TEXT format.
17. Send: ***AT+CLIP=1***
    Identifies caller by his phone number.
18. Send: ***ATE0***
    Don't echo sent characters.
19. Send: ***AT&W***
    Stores all settings.

20. Connect modem on COM2 of CyBro-2 with GSM modem cable.
21. Connect CyBro-2 to PC using programming cable and run CyPro development tool (Figures 3 and 4).

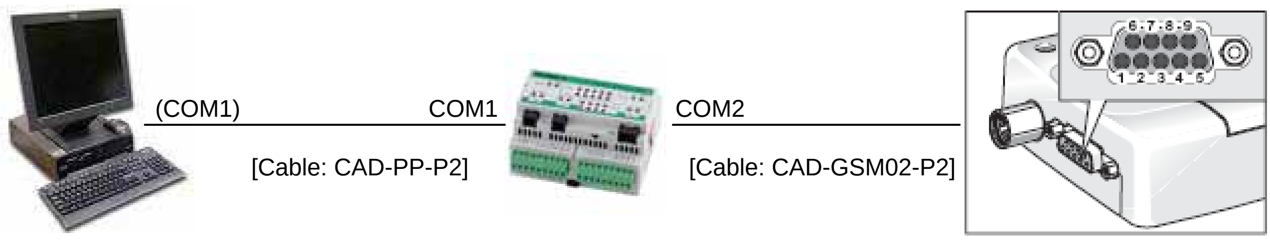


Figure 3: Connecting schematic.

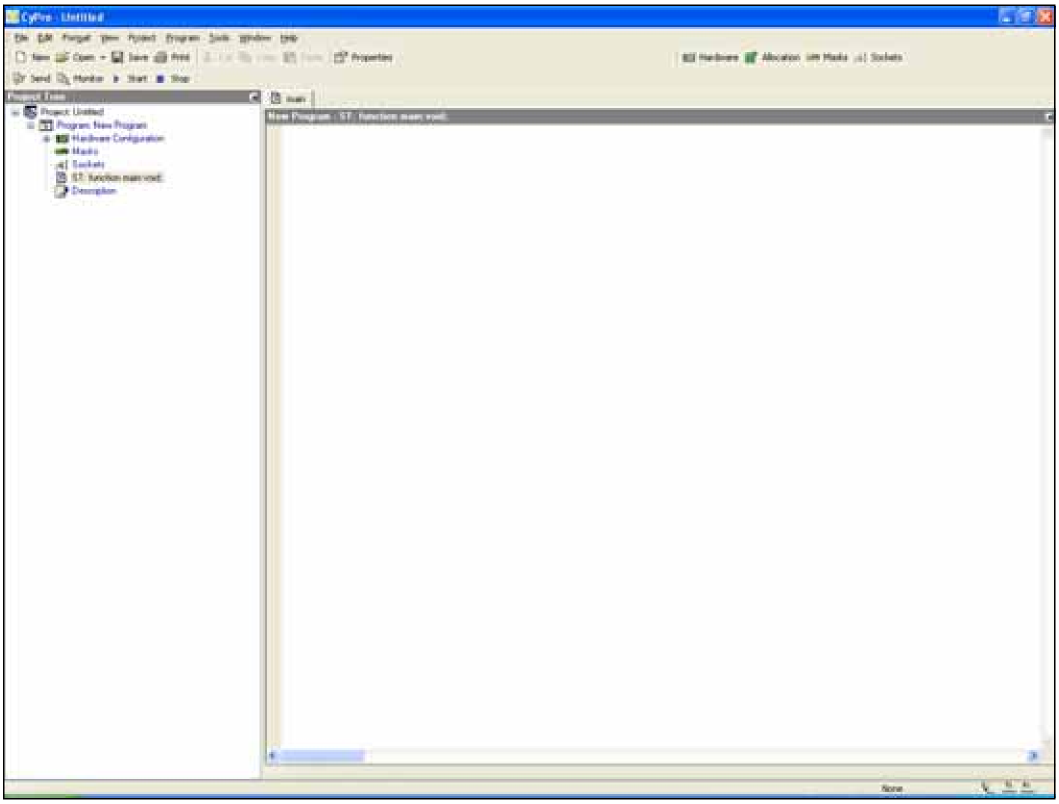


Figure 4: CyPro development tool main interface window.

22. Power-up CyBro-2.
23. Open project “GPRSModem.cyp”.

24. Run hardware detect => Autodetect. If connections are OK CyBro-2 should automatically be detected.

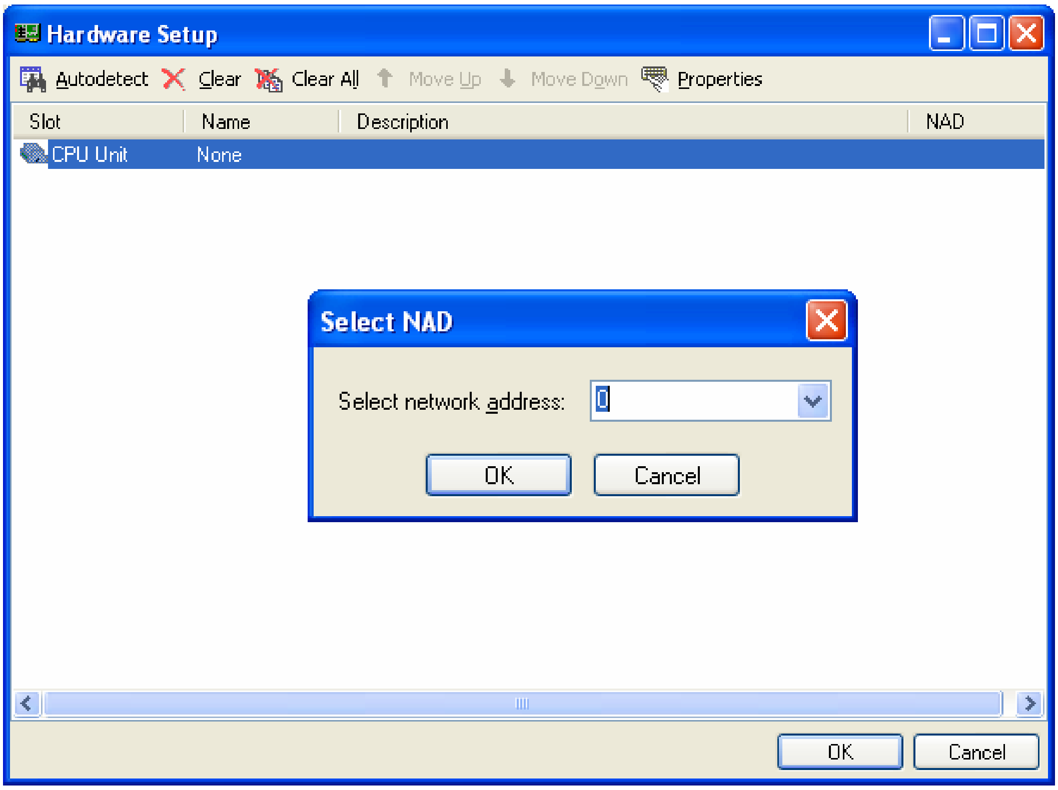


Figure 5: Detecting hardware in CyPro software.

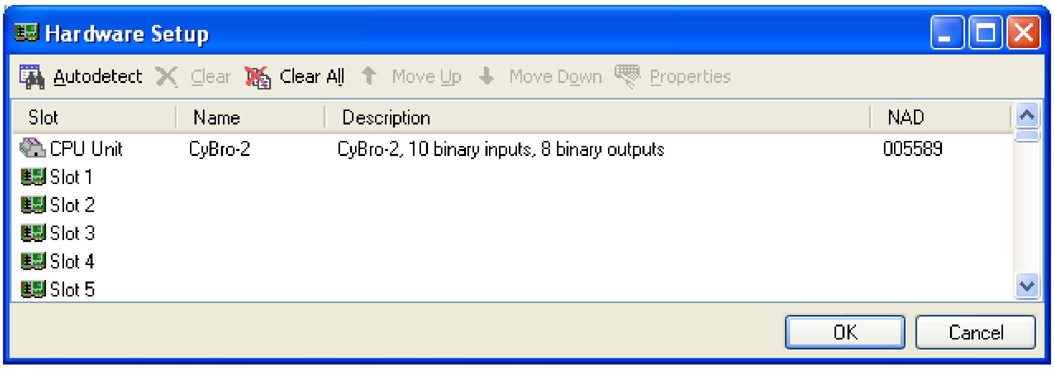


Figure 6: Successful detection of CyBro-2.

GPRSModem.cyp

This demo program has some basic functionality for demonstrating the use of the GSM (GPRS) modem in home automation.

CyBro's output pins **QX0** and **QX1** are controllable via phone calls or SMS messages sent to modem.

Before loading demo program into CyBro-2 there are some changes that must be made.

1. In *modem_DecodeCaller* subroutine:

   Line 4,13: Insert phone number of the phone which will be able to send commands to CyBro[1](Figure 7).

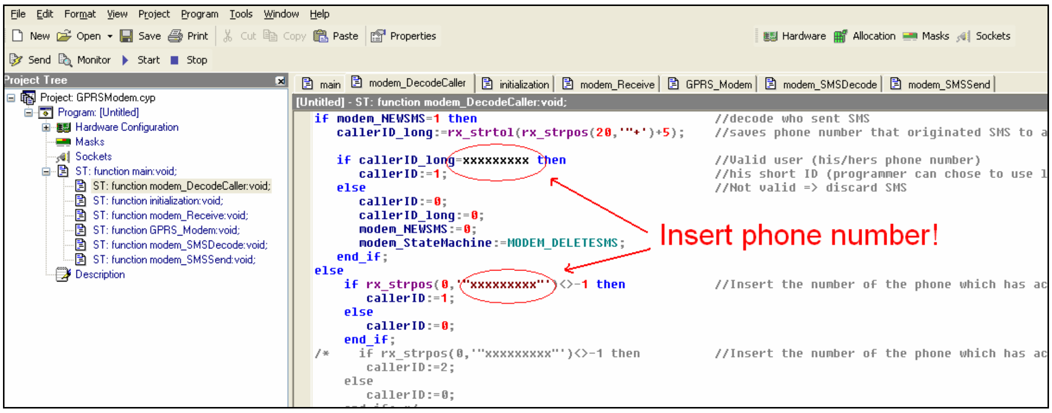


Figure 7: Inserting phone number in the demo program.

[1] When receiving SMS originator's phone number is translated from text to number (long integer – 32 bits). This limits the number or digits a phone number can have up to **9** (country prefix is not needed).

2. In *modem_SMSSend* subroutine:

Line 6: Change to your country's prefix number. Also the number of 'X' following prefix must be equal to the number of digits your phone numbers have.

Line 7: If your country's prefix number is not 3 digits long then adjust second parameter to 12 (for 2 digits) or 11 (for 1 digit).

```
dprns(0,0,0,'AT+CMGS="+386xxxxxxxx"\n');
dprnl(0,13,0,8,0,callerID_long);
tx_start(24);
```

Figure 8: Adjusting *modem_SMSSend* subroutine.

Line 8: If number of characters that are to be sent to modem is changed insert the correct value here (Figure 9).

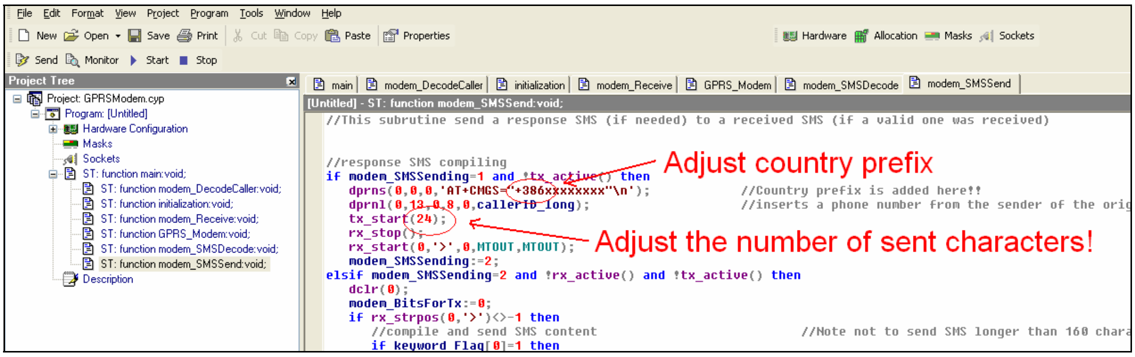
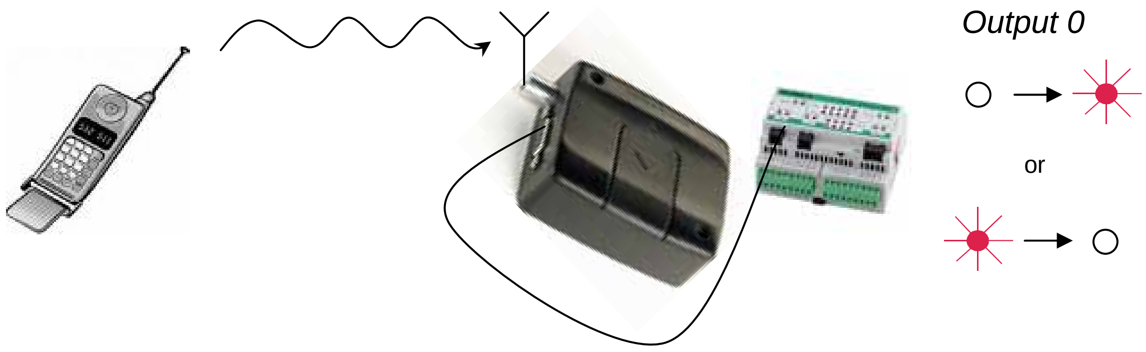


Figure 9: Adjusting *modem_SMSSend* subroutine.

3. Load demo program into CyBro-2 and run it.

Functionality

- Calling GPRS modem with the phone whose number you entered in *modem_DecodeCaller* subroutine will toggle the output 0 on CyBro-2 (**QX0**). Call will be terminated by CyBro-2 automatically upon output toggling.



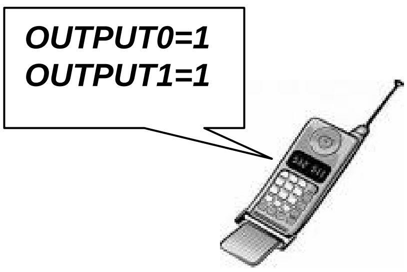
- Sending SMS with keywords can also control output pins. Sending SMS must also be done from a phone whose number was set in *modem_DecodeCaller* subroutine. Order in which they are sent is not important.

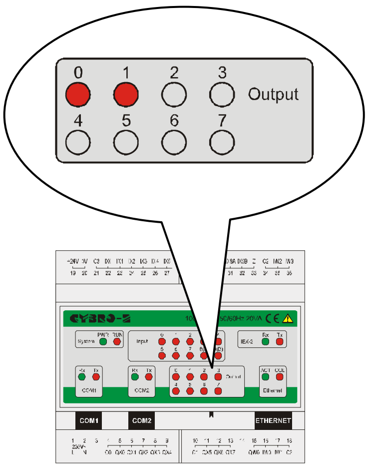
Keywords:

OUTPUT0=X	-where ***X*** can be ***0*** (OFF), ***1*** (ON) or ***2*** (TOGGLE ON/OFF)
OUTPUT1=X	-where ***X*** can be ***0*** (OFF), ***1*** (ON) or ***2*** (TOGGLE ON/OFF)
STATUS=?	-sending this keyword will make a response SMS with value of both outputs

Example:

SMS sent to modem: | *ACTION:* | *Response SMS:*





(no response SMS)

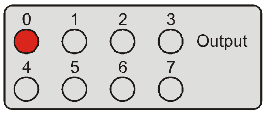
SMS sent to modem: | ACTION: | Response SMS:

STATUS=?

(no action)

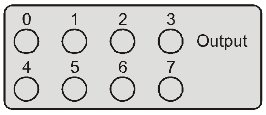
OUTPUT0=1
OUTPUT1=1

STATUS=?
OUTPUT1=2



OUTPUT0=1
OUTPUT1=0

OUTPUT0=0
OUTPUT1=0



(no response SMS)

Including subroutine to custom project

This demo project can be used as a base for developing a custom application that requires remote controlling and monitoring of a system via phone calling and SMSing.

Additional documents and sources

1. Sony Ericsson: GM Technical Description.
   File name: “gm29_TechnicalDescription.pdf”.
   Available for download at:
   http://www.cybrotech.co.uk/partners/Downloads/Data%20Sheets/gm29_TechnicalDescription.pdf

2. Cybrotech LTD: CyPro User Manual revision 220.
   File name: “CyPro User Manual v220.pdf”.
   Available for download at: http://www.cybrotech.co.uk/index.php?lang=en&module=file&path=/Manuals

3. Cybrotech LTD homepage.
   Link: http://www.cybrotech.co.uk

4. Sony Ericsson GM29 product page.
   Link: http://www.sonyericsson.com/spg.jsp?cc=us&lc=en&ver=4002&template=pp1_1&zone=pp&lm=pp1&pid=10034

Included files

1. Cybrotech: GPRS Modem Demo, CyPro software files.
   Files: - GPRSModem.cyp

Note: To access file, open Attachments tab, select file and press Save.