intercel ™

go anywhere communication and data transfer

Smart SAM4Q

USER MANUAL

CONTACT INFORMATION

CUSTOMER SUPPORT

Feel free to contact Intercel's dedicated technical support in case you need any assistance.

CONTACT US

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TRADEMARKS AND PERMISSIONS

DISCLAIMER

REVISION HISTORY

Revision	Date	Description
1.0	03/04/2017	Initial Version
1.1	27/04/2017	Update power supply statement
1.2	28/08/2017	Update led display
1.3	09/05/2018	Update formatting

TABLE 1 REVISION

SECTION 1- INTRODUCTION

The Smart SAM4Q is a compact, light-weight, 3G and LTE based modem. It provides CAT1 speed of 5Mbps upload and 10Mbps download.

The Smart SAM4Q is designed for both mobile and fixed M2M applications. It has an RJ45 socket for input voltage and the serial RS232 signals, an FME-male for antenna connection, a SIM holder and an LED indicator.

The Smart SAM4Q is capable of sending/receiving SMS, Circuit Switched Data in 3G mode and Packet-Switched Data.

Mini-USB port

FME male for antenna   LED   Mini-SIM Compartment

RJ-45 docket for input power and serial RS232

Mobile station engine	EC21-AUT
EU approval	CE-2202
3GPP	CAT1
RCM tick mark	

SECTION 2 – SAFETY PRECAUTIONS

The following safety precautions must be observed whenever the Smart SAM4Q modem is in operation or in service. Failure to comply with these precautions violates the safety standards of the design, manufacture and intended use of the product

- Switch off the Smart SAM4Q modem:
  - In hospitals or places where medical equipment may be in use
  - In an aircraft
  - Refueling points
  - Explosive areas
- Restricted use of the Smart SAM4Q modem:
  - Near any chemical plant
  - Near any fuel depot
  - Areas with mobile phone warning signs

Respect national regulations on the use of cellular devices.

The Smart SAM4Q modem receives and transmits radio frequency energy while switched on, therefore interference can occur if the Smart SAM4Q is near TVs, radios, PCs or any inadequately shielded equipment.

SECTION 3 – RADIO FREQUENCY EXPOSURE – SAR

The Smart SAM4Q modem is a low-power transceiver, similar to a typical handheld GSM/GPRS/UMTS mobile phone. When it is turned on, it will emit low-level radio frequency energy.

There are different guidelines and standards around the world that govern the permitted levels of radio frequency exposure for general population. The levels include a safety margin to a human body.

The Specific Absorption rate (SAR) is a measure of the rate at which radio frequency energy is absorbed by the body when exposed to radio frequency electromagnetic field. The SAR value is determined at the highest certified power level in the laboratory conditions, but the actual SAR level of the transceiver while operating can be well below this value. This is because the transceiver is designed to use minimum power to connect to the network.

The Smart SAM4Q modem is approved to use in applications where the antenna is placed more than 21cm from the body.

For other applications, the integrator is responsible for the local SAR requirements.

Section 4 – WEEE Directive 2002/96/EC, Disposal of Old Electronic Equipment

This symbol ▬▬ on the product indicates that this product shall not be treated as household waste. It must be placed at an appropriate collection point for the recycling of electrical and electronic equipment.

By ensuring the correct disposal of this equipment, it will help the environment and human health. Recycling will also help to conserve natural resources.

The Smart SAM4Q product is RoHS compliant

SECTION 5 – PACKAGING

5.1 – CONTENTS

The Smart SAM4Q package consists of:

- Smart SAM4Q Modem
- Data Cable
- Smart SAM4Q User Guide (available at www.intercel.com.au)

5.2 – PACKAGING BOX

The carton box diameter is 120mm x 95mm x 60mm

The data cable is 2m long

The label diameter is 50mm x 33mm

A suitable power supply is available on request. Smart SAM4Q must be powered using a limited power source of 12V/1A power supply according to the clause 2.5 of AS/NZS 60950.1.

A suitable antenna is also available on request. Please make sure the correct antenna is used to get optimized performance from the Smart SAM4Q

5.3 – PRODUCTION LABEL

Product Model: Smart SAM4Q
Module Firmware : EC21AUTFAR02
Modem Software : Version 1.C
Modem Hardware : Revision2
IMEI

The production part number is located at the back of the Smart SAM4Q, which includes:

- Product Model
- Software Version
- Hardware Version
- IMEI Number
- Manufacturer
- Part Number

SECTION 6 – FUNCTIONALITY

6.1 – GENERAL

The Smart SAM4Q modem consists of an RJ45 socket for serial port and input power, an FME male antenna connector and a SIM holder. The LED indicator, located next to the SIM holder, indicates the Smart SAM4Q operating status. It also has a USB port to download firmware.

FME connector

```
                            ┌──────────────┐
                            │  USB         │
                            │  MiniB       │
                            └──────────────┘
        ┌──────────────┐
        │ Quectel EC21-│   ┌──────────┐
        │ AUT 3G/LTE   │   │ Switching│
        │              │   │ Power    │
        │              │   │ Supply   │
        └──────────────┘   └──────────┘      ┌──────────┐
                                             │ RJ45     │
        ┌──────────────┐   ┌──────────┐      │ Socket   │
        │ SIM Interface│   │ ARM Cortex│     └──────────┘
        └──────────────┘   │ M3       │
                           └──────────┘      ┌──────────┐
        ┌──────────────┐   ┌──────────┐      │ RS232    │
        │ LED Indicator│   │Serial Data│     │ Serial   │
        └──────────────┘   │ switches  │     │ Data     │
                           └──────────┘      │ Interface│
                                             └──────────┘
```
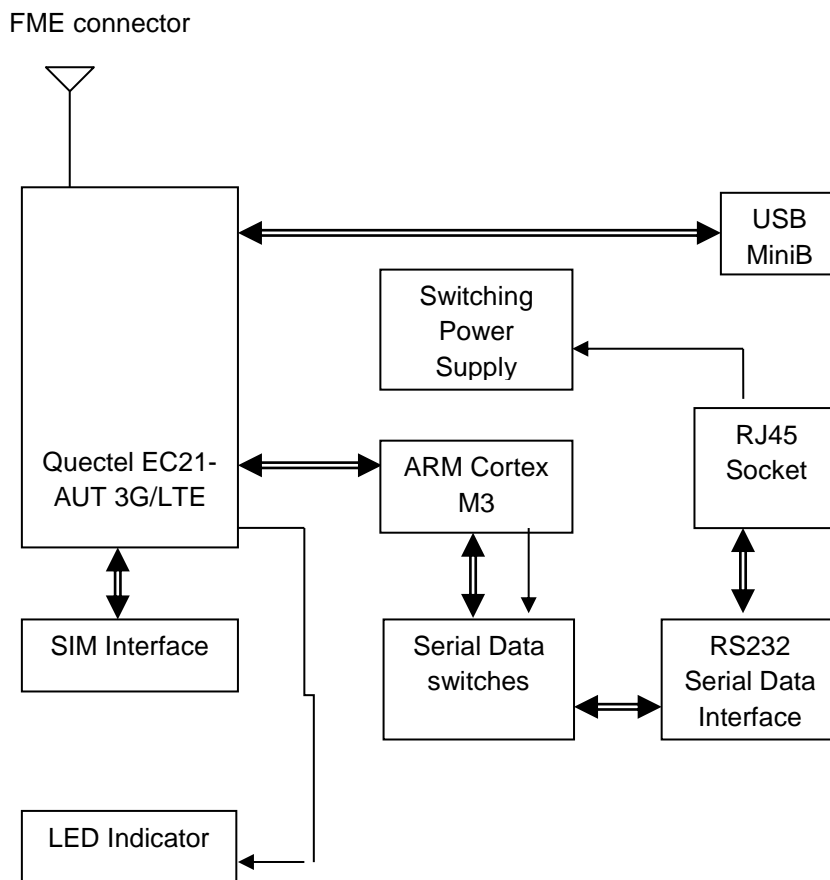
The Smart *SAM4Q Functional Block Diagram*

6.2 - RJ45 SOCKET

Pin	Signals	Description
1	VIN	Input voltage 5Vdc - 32Vdc
2	DCD	Data Carrier Detect
3	DTR/RI	Data terminal Ready/Ring Indicator
4	GND	Common Ground
5	RXD	Serial Data out of the Smart SAM4Q
6	TXD	Serial Data into the Smart SAM3
7	CTS	Clear to Send
8	RTS	Ready to Send

6.3 - MINI USB CONNECTOR

Pin	Signal
1	Vusb
2	D-
3	D+
4	N/C
5	GND

6.4 - FME-MALE 50 Ω ANTENNA CONNECTOR

The FME male antenna connector is a 50Ω impedance antenna connector. The antenna used for the Smart SAM4Q must have 50Ω impedance.

6.5 - SIM HOLDER

The SIM holder is designed to accommodate a mini-SIM card. The SIM card can either be 3V or 1V8 SIM. To insert the SIM card, remove the door by sliding it back towards the end. Make sure the SIM card faces the right way as indicated on the box. Voltage levels over this SIM interface complies with 3GPP standards.

6.6 - LED STATUS

The LED display has changed in PCB R2 and firmware SAM4Q V1.634 22/08/17 17:15.

The LED indicator has the following status for different SAMMODE:

SAMMODE=0

-Modem power on: Red Led on permanently

-Modem on 3G band: Orange Led on permanently

-Modem on 4G band: Green Led 100ms on 3000ms off

SAMMODE=1

Modem power on until SIM ready: Red LED On

Modem initialize on 3G: Red LED 1s On/Off

Modem initialize on 4G: Red LED 500ms On/Off

Remote socket connection on 3G: Orange LED 500ms On/Off

Remote socket connection on 4G: Green LED 500ms On/Off

Modem failed to connect to IP: Red LED 100ms On/Off

Modem connected to IP: Green LED flashing on 4G, Orange LED flashing on 3G, LED timing patterns are explained below.

3G RSCP Signal Strength

> -70 dBm	4 pulses of Orange LED (100ms On 300ms Off) then 3s Off
-70 dBm to -85 dBm	3 pulses of Orange LED (100ms On 300ms Off) then 3s Off
-86 dBm to -100 dBm	2 pulses of Orange LED (100ms On 300ms Off) then 3s Off
< -100 dBm	1 pulse of Orange LED (100ms On 300ms Off) then 3s Off

4G RSRP Signal Strength

> -90 dBm	4 pulses of Green LED (100ms On 300ms Off) then 3s Off
-90 dBm to -105 dBm	3 pulses of Green LED (100ms On 300ms Off) then 3s Off
-106 dBm to -120 dBm	2 pulses of Green LED (100ms On 300ms Off) then 3s Off
< -120 dBm	1 pulse of Green LED (100ms On 300ms Off) then 3s Off

IP connected idle state, network searching or limited service: Red LED flashing, LED timing patterns are explained below.

3G RSCP Signal Strength

> -70 dBm	4 pulses of Red LED (100ms On 300ms Off) then 3s Off
-70 dBm to -85 dBm	3 pulses of Red LED (100ms On 300ms Off) then 3s Off
-86 dBm to -100 dBm	2 pulses of Red LED (100ms On 300ms Off) then 3s Off
< -100 dBm	1 pulse of Red LED (100ms On 300ms Off) then 3s Off

4G RSRP Signal Strength

> -90 dBm	4 pulses of Red LED (100ms On 300ms Off) then 3s Off
-90 dBm to -105 dBm	3 pulses of Red LED (100ms On 300ms Off) then 3s Off
-106 dBm to -120 dBm	2 pulses of Red LED (100ms On 300ms Off) then 3s Off
< -120 dBm	1 pulse of Red LED (100ms On 300ms Off) then 3s Off

FOTA (4G/3G module Firmware Over The Air upgrade) or DOTA (Modem software Download Over the Air upgrade):

Process run on 3G: Orange LED 100ms On/Off

Process run on 4G: Green LED 100ms On/Off

SAMMODE=2

Modem only works in CSD mode if it is set to 3G bands only.

Modem power on until SIM ready: Red LED On

Modem initialize on 3G: Red LED 1s On/Off

Modem in data call mode: Orange LED 500ms On/Off

Modem in CSD idle mode ready to receive incoming CSD call: Orange LED flashing on 3G, LED timing patterns are explained below.

3G RSCP Signal Strength

|	
> -70 dBm	4 pulses of Orange LED (100ms On 300ms Off) then 3s Off
-70 dBm to -85 dBm	3 pulses of Orange LED (100ms On 300ms Off) then 3s Off
-86 dBm to -100 dBm	2 pulses of Orange LED (100ms On 300ms Off) then 3s Off
< -100 dBm	1 pulse of Orange LED (100ms On 300ms Off) then 3s Off

CSD idle state, network searching or limited service: Red LED flashing, LED timing patterns are explained below.

3G RSCP Signal Strength

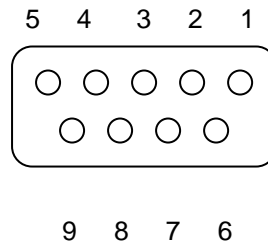|	
> -70 dBm	4 pulses of Red LED (100ms On 300ms Off) then 3s Off
-70 dBm to -85 dBm	3 pulses of Red LED (100ms On 300ms Off) then 3s Off
-86 dBm to -100 dBm	2 pulses of Red LED (100ms On 300ms Off) then 3s Off
< -100 dBm	1 pulse of Red LED (100ms On 300ms Off) then 3s Off

6.7 - DATA CABLE

The data cable is 2m long. It consists of an RJ45 plug, a DB9-female connector and a 2-wire input power.
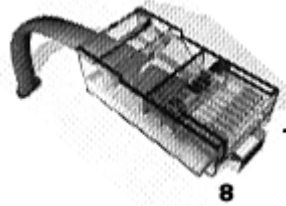
DB9	Signals		RJ45	Description
1	DCD	←→	2	Data Carrier Detect
2	RXD	←→	5	Serial Data out of the Smart SAM4Q
3	TXD	←→	6	Serial Data into the Smart SAM4Q
4	DTR		3	Not used
5	GND	←→	4	Common Ground
6	DSR			
7	RTS	←→	8	Ready to Send
8	CTS	←→	7	Clear to Send
9	RI	Not used		
			1	RED wire : Input voltage from 5Vdc to 32Vdc
			4	BLACK wire : Power Ground

SECTION 7 – ELECTRICAL CHARACTERISTICS

7.1 - POWER CONSUMPTION

Idle mode	30mA @12V
Average in-use mode	140mA@12V
Full Tx power	230mA@12V
Peak current requirement	0.3A@12V

7.2 - RECEIVE SENSITIVITY

Band	Primary (without Diversity)	Diversity
3G B1	-110.0 dBm	-
3G B5	-100.5 dBm	-
LTE-FDD B1 (10M)	-98.5 dBm	-98.0 dBm
LTE-FDD B3 (10M)	-98.0 dBm	-96.0 dBm
LTE-FDD B5 (10M)	-98.0 dBm	-99.0 dBm
LTE-FDD B7 (10M)	-97.0 dBm	-95.0 dBm
LTE-FDD B28 (10M)	-97.0 dBm	-99.0 dBm

7.3 - CONDUCTED TRANSMIT POWER

Parameter	Min	Max
3G Bands	-50 dBm	24 dBm
LTE	-44 dBm	43 dBm

7.4 - MAIN ANTENNA SPECIFICATIONS

Max cable loss   0.5dBm
Impedance   50Ω
VSWR recommended   2:1
VSWR absolute maximum   10:1

7.5 - ENVIRONMENTAL CHARACTERISTICS

Operating temperature   -30°C to +85°C
Storage temperature   -40°C to +95°C
Humidity   90% relative humidity (non-condensing)

SECTION 8 – SMART SAM4Q TCP/IP OPERATION

The Smart SAM4Q has an MCU (Microcontroller) to control the LTE module EC21. The Smart SAM4Q can be operating in three different modes, defined by the parameter SAMMODE:

-SAMMODE=0. The modem is in standard mode. When powered on, the MCU turns on the LTE module, checks its baud rate, turns on the LED and releases control of the LTE module to the connecting device. AT commands can be sent from the serial port here after, the MCU will keep monitoring the LTE module Rx pin for AT$ commands and checks time in the RESETPERIOD parameter to reset itself and the LTE module.

-SAMMODE=1. The modem is in PSD (Packet Switch Data) smart mode. The MCU is in total control of the LTE module. When powered on the software reads all parameters from flash and activates a PSD connection, it then creates a UDP and a TCP socket to listen for data transfer connection, opens a UDP and a TCP socket to listen for remote AT commands connection. If programmed as a TCP client it will try to connect to a remote TCP server, the modem then stays in PSD online idle state waiting for SMS, UDP or TCP connection. The software maintains PSD connectivity by means of PING using POLLPERIOD parameter stored in flash.

-SAMMODE=2. The modem is in CSD (Circuit Switch Data) smart mode. This mode is used if the SIM card is not setup for PSD. The MCU is in total control of the LTE module, the modem is always waiting for a CSD call or SMS, SAMMODE=2 for CSD is only possible if the modem is programmed (with AT command) to work in 3G mode.

8.1 - COMMUNICATION SOCKETS

TCP Data: The socket connection allows transparent data (excluded IP header) to pass through from the remote host to the modem serial port and vice versa. In TCP server mode, the socket will be disconnected after 5 minutes of no data transfer.

UDP Data: The socket connection allows transparent data to pass through from the remote host to the modem serial port and vice versa. A block of data received from a remote UDP server will open a 2 minute window for data to be transferred from the serial port.

TCP AT Command: The socket connection allows a user from the host computer to send AT commands to the modem and receive its responses. The socket will be disconnected after 5 minutes of no activity. The socket can also be used for remote firmware update.

UDP AT Command: The socket connection allows a user from the host computer to send AT commands to the modem and receive its responses. The socket can also be used for remote firmware update.
.

8.2 - TCP/IP AT$ COMMANDS

Communications parameters are stored in Flash using AT$PARAMETERS.

Parameters are defined as:

APN=Access Point Name

USERNAME=Username that may be required with GPRS login

PASSWORD=Password that may be required with GPRS login

LTCPPORT=Local TCP listening port

RTCPIP=Remote TCP server IP

RTCPPORT= Remote TCP server port

TCPMODE=0 or 1 (0 to disable the modem TCP client, 1 to enable the modem TCP client)

LUDPPORT=Local binding UDP port (modem listens for UDP data on this port)

RUDPIP=Remote binding UDP IP (modem only accepts data from this IP)

RUDPPORT=Remote binding UDP port (modem sends UDP data to this port)

PINGIP=If set, the modem will send PING packet to this IP to check for PSD connectivity.

POLLPERIOD=Modem uses this time to send TRACE or PING packet to check for PSD connectivity.

RESETPERIOD=Set time to reset modem periodically.

SBREAKTIME=Serial port break time, modem will wait for this break in serial port transmission before it packetizes the data and sends.

MBREAKTIME=Modem or GSM module serial break time, use to adjust the way the modem rebuilds long IP packets from fragments of CMUX frames.

BAUDRATE=Serial port baud rate.

DATALEN=Serial port data bits 7 or 8

PARITY= NONE or ODD or EVEN

SAMMODE=0 for standard modem, 1 for PSD mode, 2 for CSD mode.

SERIALLOCK= When modem access is safeguarded by username and password, 0=serial port access is not lock, 1=serial port access is locked

LOGINTIMEOUT=Timeout (in seconds) after repeat failed login attempts (set at 5 failed attempts).

SESSIONIDLETIME=Set the time interval (in seconds) the login session could stay idle before it is closed

PPPAUTH=PAP or CHAP for PPP authentication, PAP is the default value.

All parameters can be programmed all at once.

AT$PARAMETERS=APN=telstra.extranet,USERNAME=intercel,PASSWORD=mach,LTCPPORT=10000,RTCPIP=203.45.1.236,RTCPPORT=10000,TCPMODE=,LUDPPORT=20000,RUDPIP=203.45.1.236,RUDPPORT=20000,POLLPERIOD=60,SBREAKTIME=100,MBREAKTIME=5,BAUDRATE=115200,DATALEN=8,PARITY=NONE,SAMMODE=0,SERIALLOCK=0,LOGINTIMEOUT=300,SESSIONIDLETIME=120,
PPPAUTH=PAP

Saved parameters to flash...

OK

Or a few parameters or one at a time.

AT$PARAMETERS=APN=telstra.extranet,USERNAME=intercel,PASSWORD=mach

Saved parameters to flash...

OK

AT$PARAMETERS=LTCPPORT=10000,RTCPIP=203.45.1.236,RTCPPORT=10000,TCPMODE=,LUDPPORT=20000,RUDPIP=203.45.1.236,RUDPPORT=20000

Saved parameters to flash...

OK

AT$PARAMETERS=POLLPERIOD=60,SBREAKTIME=100,MBREAKTIME=5,BAUDRATE=115200,DATALEN=8,PARITY=NONE

Saved parameters to flash...

OK

AT$PARAMETERS=SAMMODE=0

Saved parameters to flash...

OK

AT$PARAMETERS?
$PARAMETERS:
APN: telstra.extranet
USERNAME: intercel
PASSWORD: mach
LTCPPORT: 10000
RTCPIP: 203.45.1.236
RTCPPORT: 10000
TCPMODE: 0
LUDPPORT: 20000
RUDPIP: 203.45.1.236
RUDPPORT: 20000
BAUDRATE: 115200
DATALEN: 8
PARITY: NONE
POLLPERIOD: 60
RESETPERIOD: 1440
SBREAKTIME: 100
MBREAKTIME: 5
SERIALLOCK: 0
LOGINTIMEOUT: 300
SESSIONIDLETIME: 120
PPPAUTH: CHAP
SAMMODE: 0
OK

AT$UDPCONNECT

If the modem is already allocated an IP address, this command will put the modem in UDP data mode, the modem DCD pin goes high, data from serial will be packetized into UDP packets and sent to remote UDP server (UDP settings must be set prior), modem will return to AT Command mode if it receives no UDP data in 30 seconds.

If modem has no IP address (CSD mode or SAMMODE=2), the modem will connect to PSD and go into UDP data mode, the modem DCD pin goes high, data from serial will be packetized into UDP packets and sent to

remote UDP server (UDP settings must be set prior), modem will reset and return to CSD mode if it receives no UDP data in 30 seconds.

AT$TCPCONNECT

If the modem is already allocated an IP address, this command will make a TCP client connection to the remote TCP server, the modem will return to AT Command mode if it receives no TCP ACK in 30 seconds.

If the modem has no IP address (CSD mode or SAMMODE=2), the modem will connect to PSD and make a TCP client connection to the remote TCP server, the modem will reset and return to CSD mode if it receives no TCP ACK in 30 seconds.

AT$DDNS

Use to setup parameters required for Dynamic DNS updating.

Parameters are defined as:

DDNSENABLE= 0 or 1 (0 disable, 1 enable)

DDNSHOST=Host name

DDNSUSERNAME=DNNS account name

DDNSPASSWORD=DDNS account password

DDNSSERVER=DDNS server

DDNSSTRING: Only need to change from default in some circumstances with Intercel support

DDNSAUTH: Only need to change from default in some circumstances with Intercel support

DDNSAGENT: Only need to change from default in some circumstances with Intercel support

PDNSIP=Primary DNS, leave blank if not using your own DNS server, not a requirement for DDNS.

SDNSIP=Secondary DNS, leave blank if not using your own DNS server, not a requirement for DDNS

DNSTTL= DNS Time To Live in minutes before updating of DNS entries, not a requirement for DDNS.

AT$DDNS=PDNSIP=8.8.8.8,SDNSIP=8.8.4.4,DNSTTL=240,DDNSENABLE=0,DDNSHOST=intercelau.ddns.net,DDN
SUSERNAME=intercelau,DDNSPASSWORD=123456789,DDNSSERVER=dynupdate.noip.com,DDNSSTRING=GET
/nic/update?hostname=%s&myip=%sHTTP/1.0,DDNSAUTH=Authorization: Basic%s,DDNSAGENT=User-
Agent:SAM4Q/1.0 intercel@intercel.com.au

Saved parameters to flash...

OK

AT$DDNS?

$DDNS:
DDNSENABLE: 0
DDNSHOST: intercelau.ddns.net
DDNSUSERNAME: van.phamus@yahoo.com
DDNSPASSWORD: 123456789
DDNSSERVER: dynupdate.no-ip.com
DDNSSTRING: GET /nic/update?hostname=%s&myip=%s HTTP/1.0
DDNSAUTH: Authorization: Basic %s
DDNSAGENT: User-Agent: SAM4Q/1.0 intercel@intercel.com.au
PDNSIP: 8.8.8.8
SDNSIP: 8.8.4.4
DNSTTL: 240

OK

AT$DDNSTEST

Use to force a manual updating of IP to the DDNS server, all required parameters must be set beforehand.

AT$DDNSTEST

$DDNSTEST: Starting....

$DDNSTEST: Resolving dynupdate.no-ip.com....

Connecting to DDNS dynupdate.no-ip.com ....

Connected to DDNS dynupdate.no-ip.com
HTTP/1.1 200 OK
Date: Tue, 02 Sep 2014 00:33:32 GMT
Server: Apache/2
Content-Location: update.php

Vary: negotiate
TCN: choice
Content-Length: 19
Connection: close
Content-Type: text/plain; charset=UTF-8

good 123.209.169.62
DDNS host intercelau.ddns.net updated with 123.209.169.62

OK

AT$ACCESS

Use to setup parameters required for remote access.

Parameters are defined as:

IPBLOCK=0 or 1 (0 disable, 1 enable remote IP access from REMOTEIP1-REMOTEIP4)

REMOTEIP1= nnn.nnn.nnn.nnn

REMOTEIP2= nnn.nnn.nnn.nnn

REMOTEIP3= nnn.nnn.nnn.nnn

REMOTEIP4= nnn.nnn.nnn.nnn

SMSBLOCK=0 or 1 (0 disable, 1 enable remote SMS access from REMOTESMS1-REMOTESMS4)

REMOTESMS1= ccnnnnnnnnn cc for country code

REMOTESMS2= ccnnnnnnnnn

REMOTESMS3= ccnnnnnnnnn

REMOTESMS4= ccnnnnnnnnn

DIALBLOCK= 0 or 1 (0 disable, 1 enable remote dialing access from REMOTEDIAL1-REMOTEDIAL4)

REMOTEDIAL1= acnnnnnnnn ac for area code

REMOTEDIAL2= acnnnnnnnn

REMOTEDIAL3= acnnnnnnnn

REMOTEDIAL4= acnnnnnnnn

AT$ACCESS=IPBLOCK=1,REMOTEIP1=10.64.24.2,REMOTEIP2=,REMOTEIP3=,REMOTEIP4=,SMSBLOCK=1,REMOTESMS1=0413586218,REMOTESMS2=,REMOTESMS3=,REMOTESMS4=,DIALBLOCK=1,REMOTEDIAL1=0395612959,REMOTEDIAL2=,REMOTEDIAL3=,REMOTEDIAL4=

Saved parameters to flash...

OK

AT$ACCESS?

```
$ACCESS:
IPBLOCK: 1
REMOTEIP1: 10.64.24.2
REMOTEIP2:
REMOTEIP3:
REMOTEIP4:
SMSBLOCK: 1
REMOTESMS1: 0413586218
REMOTESMS2:
REMOTESMS3:
REMOTESMS4:
DIALBLOCK: 1
REMOTEDIAL1: 0395612959
REMOTEDIAL2:
REMOTEDIAL3:
REMOTEDIAL4:

OK
```

AT$LGSMS

Use to program parameters for last gasp SMS.

Parameters are defined as:

LGSMSMSG=SMS message text, default is "SAM4Q low power detected..."

LGSMSDELAY= Time delay to make sure supply power is down for this long before sending last gasp SMS

LGSMSNO=SMS phone number

AT$LGSMS= LGSMSMSG= SAM4Q power supply is low....,60,LGSMSNO=+61418505361

Saved parameters to flash...

OK

```
AT$LGSMS?
$LGSMS:
LGSMSMSG: SAM4Q power supply is low....
LGSMSDELAY: 60
LGSMSNO: +61418505361

OK
```

AT$LOGIN

Use to setup login details for remote sending of AT commands, parameters and software updating; password is encrypted so remote login required PC software Smart SAM4Q Terminal.

AT$LOGOFF

Use to log off remote access instantly.

AT$IP

Use to return the allocated IP addresses of the current GPRS connection

AT$IP

$IP: 120.157.107.60
$DNS Primary: 10.4.182.20
$DNS Secondary: 10.4.81.103

OK

AT$VERSION

This command returns the TCP/IP software version.

AT$VERSION

SAM4Q V1.632 29/03/17 13:49

OK

AT$RESET

Use to remotely reset the modem, normally after sending of new parameters

AT$RESET

SAM Reset...

OK

AT$SMSTOSERIALON

This command allows the connecting device to receive SMS notification for 300s: e.g. "+CMTI: "SM",1", the connecting device must send AT+CMGR to read SMS and AT+CMGD to delete it, during this 300s period, the modem will not be able to decode AT$ commands sending to it over SMS.

AT$HTTPFOTA

Use to start FOTA (LTE module Firmware Download Over The Air).

AT$HTTPFOTA=HTTP server string

AT$HTTPFOTA=http://161.43.199.19:80/upgrade_1206-1206B.zip

AT$DOTA

Use to start DOTA (Modem software Download Over The Air).

AT$DOTA=FTP_Server,FTP_Username,FTP_Password,FTP_Path,FTP_Filename

FTP_Server: FTP server in dot format nnn.nnn.nnn.nnn

FTP_Username: Maximum length 100

FTP_Password: Maximum length 100

FTP_Path: Maximum length 50

FTP_Filename: Maximum length 50

AT$DOTA=120.157.48.51,vanpham,Intercel,/SAM4Q/,SAM4Q_v151.bin

OK

AT$GETLOG

Use to check read logged events from flash.

Read all logged events:

AT$GETLOG
$GETLOG:
1 2015/04/08 13:08:25+40 257 Software start
2 2015/04/08 13:08:30+40 259 EC21_OFF
3 2015/04/08 13:08:36+40 258 EC21_ON
4 2015/04/08 13:08:42+40 288 NW registered
…..
249 2015/04/09 10:52:19+40 320 $version.
250 2015/04/09 11:17:10+40 320 $getlog.

OK

Read last 5 events:

 AT$GETLOG=5
$GETLOG:
246 2015/04/09 10:26:15+40 288 NW registered
247 2015/04/09 10:26:16+40 262 /04/09,10:26:16
248 2015/04/09 10:52:19+40 320 $version.
249 2015/04/09 11:17:10+40 320 $getlog.
250 2015/04/09 11:21:13+40 320 $getlog=5.

OK

AT$CLEARLOG

Use to clear logged events from flash.

AT$CLEARLOG

OK

AT$MODEMLOG

Use to enable and disable events logging,

AT$MODEMLOG=1 enable logging

AT$MODEMLOG=0 disable logging

AT$MODEMLOG?

$MODEMLOG: 1

OK

AT$DEFAULT

Use to restore modem's parameters to default settings.

AT$DEFAULT

OK

8.3 - CSD CALL ESCAPE SEQUENCE

During CSD call to the Smart SAM4Q modem, send three consecutive EscEscEsc or hex number sequence 0x1B 0x1B 0x1B to switch the modem between data mode and remote AT commands mode.

SECTION 9 – FIRMWARE UPGRADE

9.1 - THE LTE MODULE FIRMWARE

The module firmware can be upgraded via the modem's serial port, or can be upgraded over-the-air (FOTA) by instructing it to download from a HTTP server.

9.2 - THE MODEM CONTROLLER SOFTWARE

The modem's software can be upgraded over the JTAG port using the SAM-BA software tool from ATMEL.

The modem software and parameters can be upgraded over the serial port, PSD, CSD or SMS (parameters only) using SAM Terminal Program running on PC.

For mass upgrade of modem's software, the new software can be loaded onto a FTP server and the modem instructed to download the new software from this FTP server.

NOTES

-In SAMMODE=0, after power on the MCU turns on the LTE module, checks its baud rate, turns on LED before releasing control of the LTE module to the connecting device. All this takes between 15 to 20 seconds, so the modem is only ready for AT commands here after.

-In SAMMODE=1, the modem takes 30 to 60 seconds to connect to PSD, the modem only responds to AT commands from serial port once it is connected to PSD or after it has failed. If it failed to connect it will reset after 120 seconds.

-In SAMMODE=2, the MCU takes about 30 seconds to set up the LTE module, the modem only responds to AT commands from the serial port after setting up is finished.

-In SAMMODE 1 and 2 if the Smart SAM4Q modem is powered up without a SIM card it will go into AT command mode after 20 seconds.

-In SAMMODE= 2 the modem can be reset remotely by calling the voice number.

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