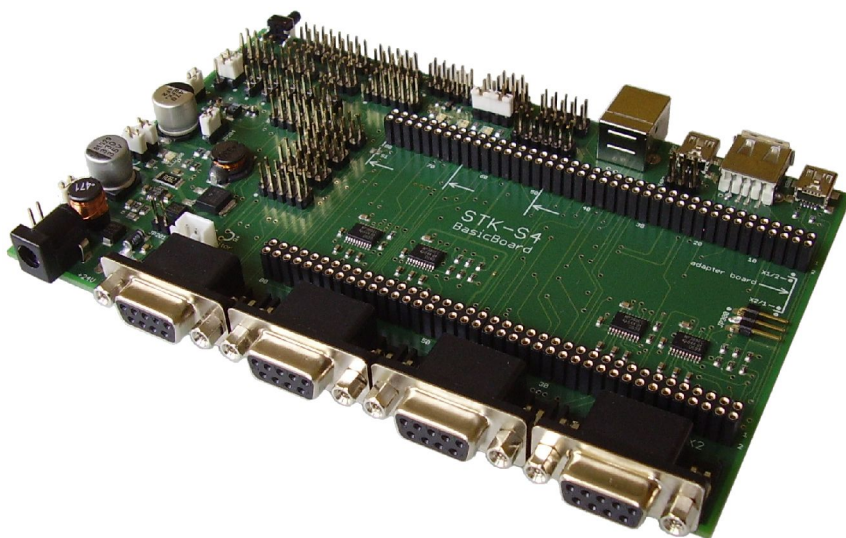


STK-S4

- *BasisBoard*
- *6..32V DC, 4xCOM, 4xUSB. JTAG*
- *Adapters: all "AarLogic"-Boards*



Specification
2012-01-26

Roundsolutions GmbH & Co. KG
www.roundsolutions.com

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1 General

Please read this specification completely and carefully before initial use. It describes correct use and includes important instructions for the installation and activation of the *STK-S4*. The manufacturer accepts no liability for damage resulting from improper use. All guarantee claims are then void.

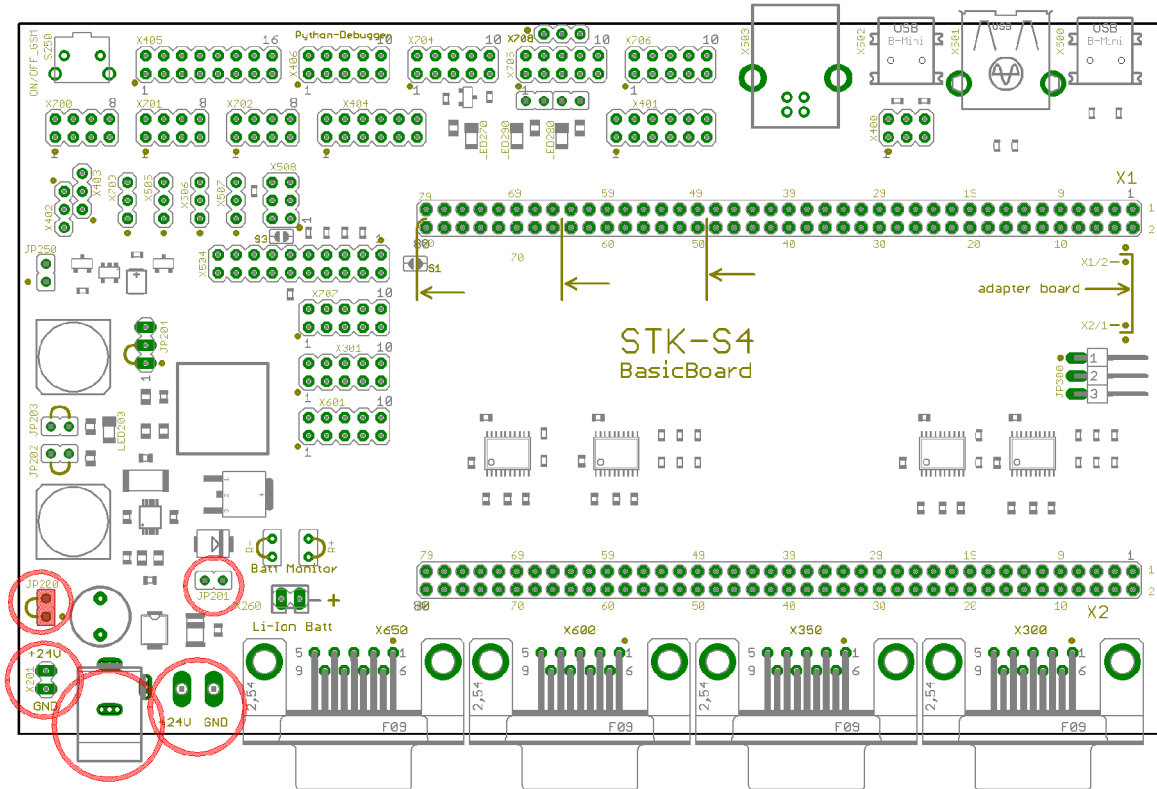
1.1. Use of the STK-S4

We would like to recommend to new customers to test the basics like voice call, SMS and data call first, before moving on to GPRS, using the GPS module, programming with Python or utilizing Linux on the AarLogic C10/3.

If you need help, we recommend that you use the Round Solutions Internet forum (www.roundsolutions.com/forum), and use the "SEARCH" function to find former postings with the same topic. It is always very helpful to mention which firmware version is inside the GPRS module (AT+GMR).

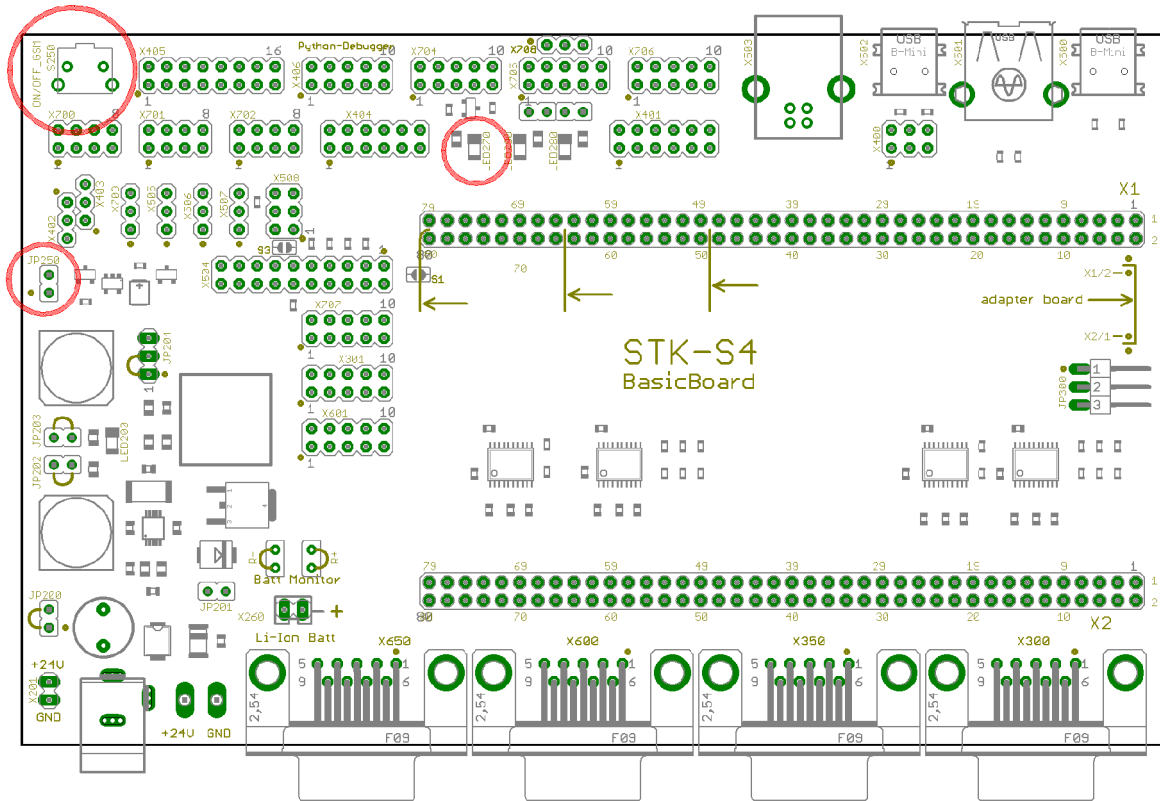
Have Fun!

1.2. Power Supply



Name	Type	Function	
X200	3,5mm Coaxial Connector	Power Supply 6VDC ... 32VDC	
X201	2 pole Connector (2,54mm)	Power Supply 6VDC ... 32VDC	
+24V / GND	Pads	Power Supply 6VDC ... 32VDC	Power Supply with Vehicle-Filter step, protects against short circuits and voltage peaks
JP200	Jumper	On / Off Switch Test Purposes	Can be opened to ascertain overall current
JP201	Jumper	Power-Shut down of the DC/DC-Converter	DC/DC-Converter disabled when closed

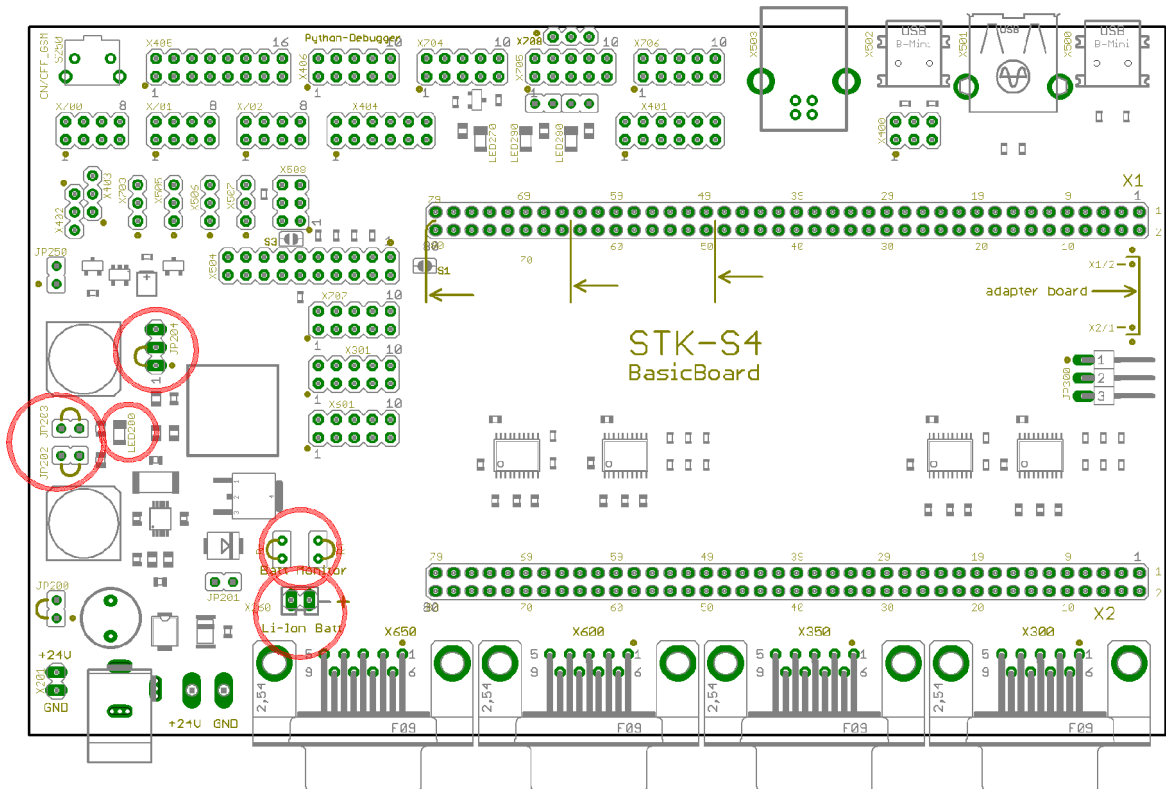
1.3. POWER ON/OFF



Name	Type	Function	
JP250	Jumper	Automatic Power-ON	If closed: Automatically switches the GSM-Module to ON when Power ON, LED270 flashes
S250	Push Button	Manual Power-ON	When operated: Switches the GSM-Module ON, LED270 flashes
LED270	LED	GSM-Module Status-LED	This LED corresponds to the STAT_LED

Switching On/Off is achieved via the ON/OFF-Pin of the GSM-Module.

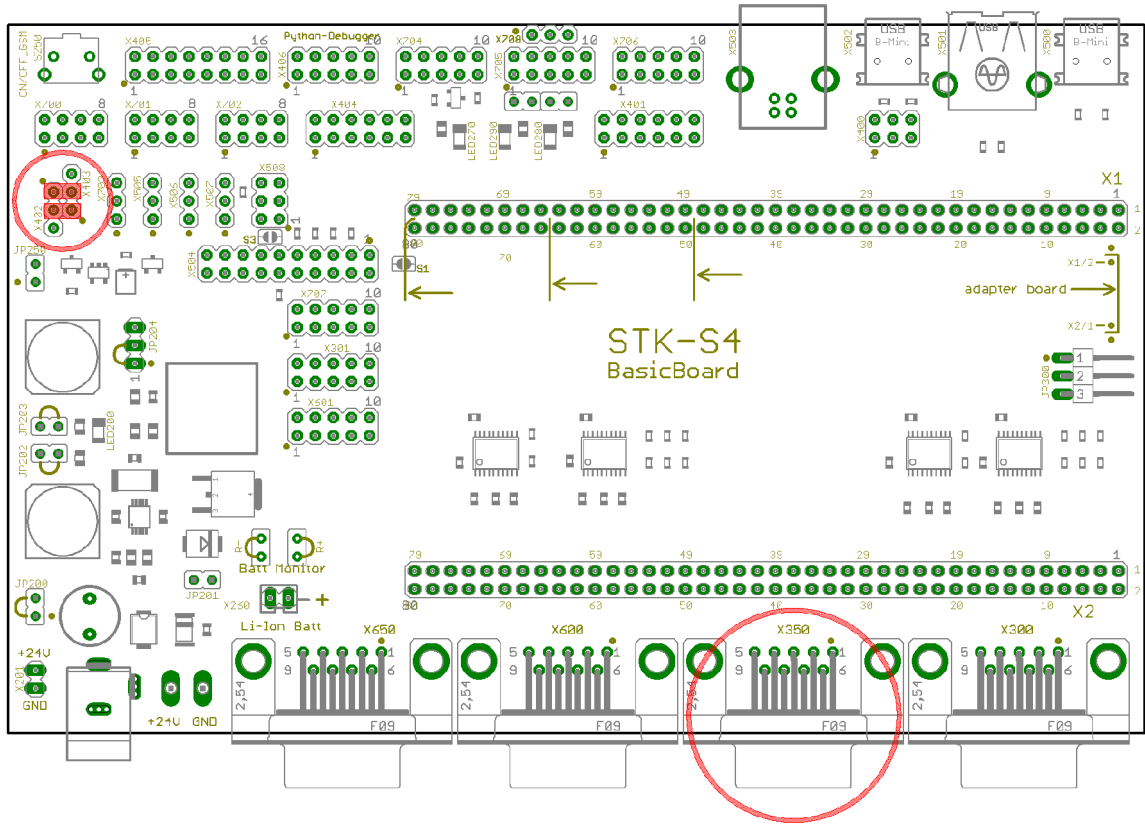
1.4. Connecting Battery



Name	Type	Function	
JP202	Jumper	Current Limiter	Closed: Battery free mode (no power limiting) Open: Battery mode (with power limiting up to 1000mA)
JP203	Jumper	Supply Voltage	Closed: Battery free mode (Supply Voltage = 4,0V) Open: Battery mode (Supply Voltage = 5,0V)
JP204	Jumper	Battery Operation	1-2 closed: Battery free mode (Supply Voltage = 4,0V) 2-3 closed: Battery mode (Supply Voltage = 5,0V) Open: Module with integrated power supply
LED200	LED	Supply Voltage Indicator	The LED illuminates, when a battery or an external power supply is connected
Li-Ion Battery			Connection of a suitable battery, check correct polarity!
Battery Monitor			Connection of a suitable battery monitor. R- and R+ must be closed whilst operating with a battery

Caution: On the Circuit Board labelling: BATT = Accumulator

1.6. GPS Functions



Name	Type	Function	
JP402	CMOS-Level, 3pole Connector (2,54mm)	GPS-Binary Data	Both of these interfaces must be connected when GPS data is to be transmitted via the GSM interface using the Telit Module
JP403	CMOS-Level, 3pole Connector (2,54mm)	Trace Interface	
X350	RS232, Sub-D	GPS-Interface	Main Interface (serial) of the GPS-Module: Pin 2 = TX_GPS (Output) Pin 3 = RX_GPS (Input) Pin 5 = GND

2 Activation of the STK-S4

The **STK-S4** can be used with the following adapter boards:

Designation	GSM	GPS	Power Supply
AarLogic-A01	Telit GE863-GPS embedded Antenna	Telit GE863-GPS external Antenna (via UFL- Connector)	4,0 V
AarLogic-C01	Telit GE863-GPS external Antenna (via UFL- Connector)	Telit GE863-GPS external Antenna (via UFL- Connector)	4,0 V
AarLogic-A05	Telit GE863-GPS embedded Antenna	Telit GE863-GPS external Antenna (via UFL- Connector)	6 – 32 V
AarLogic-C05	Telit GE863-GPS external Antenna (via UFL- Connector)	Telit GE863-GPS external Antenna (via UFL- Connector)	6 – 32 V
AarLogic-C07	Telit GE864 external Antenna (via UFL- Connector)	101N1/GPS-3M external Antenna (via UFL- Connector)	6 – 32 V
AarLogic-C10	Telit GE863-PRO ³ (Linux) external Antenna (via UFL- Connector)	101N1/GPS-3M external Antenna (via UFL- Connector)	4,0 V

2.1. Inserting the Adapter Boards

The connectors X1 and X2 of the various adapter boards have varying numbers of pins, i.e. 2 * 24 pins on the AarLogic-A01 or 2*80 pins on the AarLogic-C10.

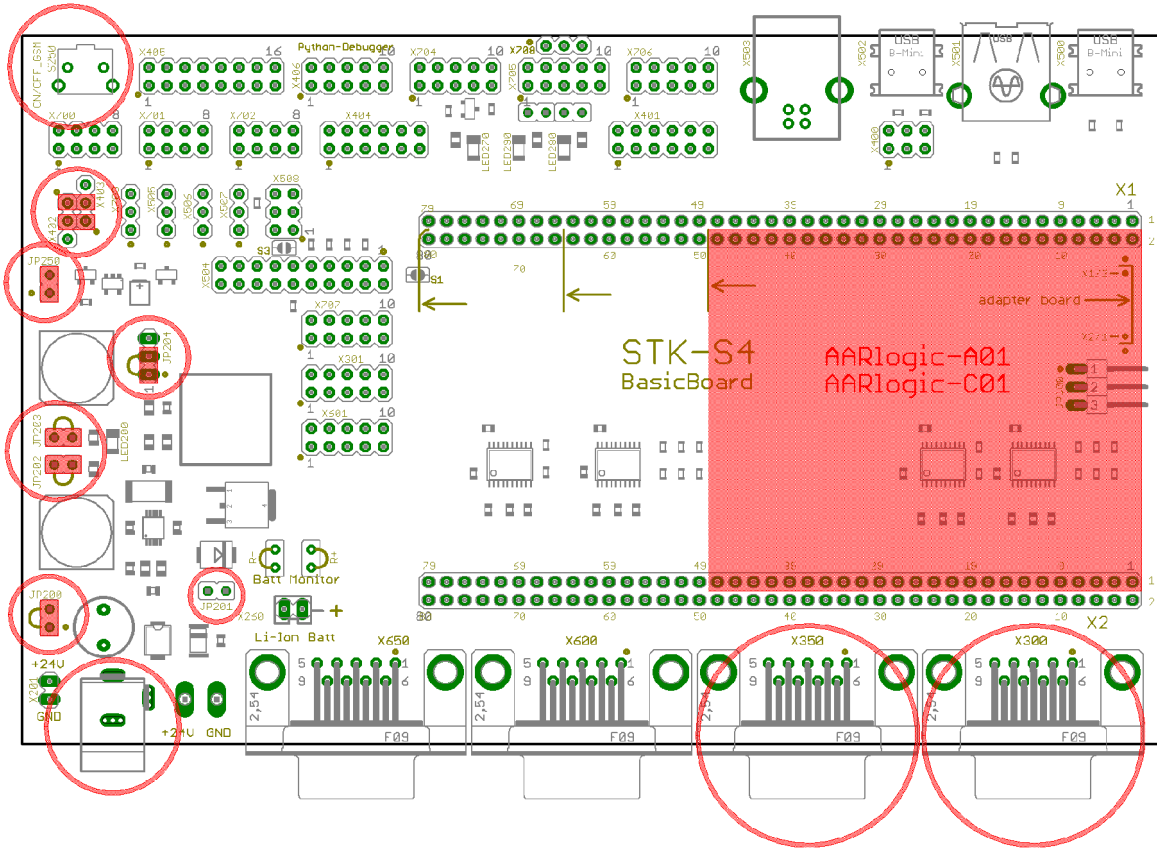
Inserting the Adapter Boards therefore requires extreme care:

All Adapter Boards must be aligned to the right (viewed from the right-hand side of the circuit board) when inserted. Adapter Boards with single row male connectors must be plugged-in centrally. Pin numbering on bush strips X1 and X2 is always from right (Pin 1) to left (Pin 80). The allocation of pin and socket strips on Adapter Boards with only single row male connectors (AarLogic-A01, C01, A05, C05, C07) varies due to the numbering methods of 1- and 2-row male connectors :

On the STK-S4	On Single Row Adapter Boards	On Twin Row Adapter Boards
X1-1 <---->		X1-1
X1-2 <---->	X1-1	X1-2
X1-3 <---->		X1-3
X1-4 <---->	X1-2	X1-4
X1-5 <---->		X1-5
X1-6 <---->	X1-3	X1-6
X1-7 <---->		X1-7
X1-8 <---->	X1-4	X1-8
X1-9 <---->		X1-9
etc.		
X2-1 <---->	X2-1	X2-1
X2-2 <---->		X2-2
X2-3 <---->	X2-2	X2-3
X2-4 <---->		X2-4
X2-5 <---->	X2-3	X2-5
X2-6 <---->		X2-6
X2-7 <---->	X2-4	X2-7
X2-8 <---->		X2-8
X2-9 <---->	X2-5	X2-9
etc.		

2.2. Activation of the STK-S4 + AarLogic-A/C01

Base Board **STK-S4** plus inserted Adapter Board **AarLogic-A01** or **AarLogic-C01**:



The following settings should be chosen for fast activation:

Name	Type	Function	
X200 X201	3,5mm Coaxial Connector 2,5mm-Male Connector	Power Supply 6VDC ... 32VDC	Plug-in Power Supply Laboratory Power Unit
JP200	Jumper	Test Purposes	closed
JP201	Jumper	Power-Shut down of the DC/DC-Converter	Open
JP202	Jumper	Current Limiting when Battery Charging up to 1000mA	closed
JP203	Jumper	Value of the Board Voltage	closed
JP204	Jumper	Supply Voltage	1-2 closed
JP250	Jumper	GSM-Auto start	closed
X300	SUB-D	Serial (Main-) Interface	PC / Terminal program (9600/8/N/1)
X350	SUB-D	Serial Interface	PC / Terminal program (9600/8/N/1)

2.3. Activation of the STK-S4 + AarLogic-A/C01

Dependent upon the adapter board in use the AarLogic-A01 or AarLogic-C01 must still be connected to a GSM and a GPS antenna. Both antenna are connected using a UFL plug. Please do not transpose the connectors!

The PC / Control Device should be attached using a X300 SUB-D connector (normal connecting lead for a serial interface, not a Null Modem Cable!). On the PC, a terminal program or an optimised control program (i.e. „TelitTest.exe“) should be started. The interface will be set to a random data transfer rate (the Telit GE863-GPS has an automatic Baud rate identifier).

The adapter board will be supplied with 4.0V from the STK-S4 when Jumper JP204/1-2 is set as shown above. When operating without a battery the power supplied will be used as module power (= operating without a battery). During battery operation power supplied from the STK-S4 will be routed via JP204/2-3 to pin Vcharge on the Telit GE863-GPS (= operating without a battery).

LED200 must illuminate continuously after applying operating power (Power Supply available). After a short pause, LED270 on the STK-S4 and LED50 on the adapter board must start to flash. These LED's equate to the STAT_LED on the Telit GE863-GPS and indicate that the module is switched ON. The Telit GE863-GPS starts automatically after Power-ON when Jumper JP250 is set. The module can also be started manually when Jumper JP250 is not set, by operating the push button S250 (S250 directly serves the ON_OFF supply line of the Telit GE863-GPS).

LED270 on the STK-S4 and LED50 on the AarLogic adapter board are switched in parallel.

In this condition (LED270 flashes) and the Telit GE863-GPS can be addressed via the X300 interface from the PC (AT-Sequences as described in „GE863-GPS_Software_User_Guide.pdf“ and „AT Commands Reference Guide.pdf“).

GPS data is distributed via interface X350 of the integrated GPS receiver. The transmission format equates to NMEA 0183. The Standard Setting of this interface is 4800/8/N/1.

CAUTION: When GPS information is to be read via the X300 interface both Jumpers on the male connector strips X402 and X403 must be bridged. The interfaces „MODEM SERIAL PORT 2 (GPS CONTROL)“ and „GPS SERIAL PORT A (SIRF BINARY)“ will thereby be looped. (TX_TRACE --> RX_GPS_BIN and RX_TRACE --> TX_GPS_BIN).

The serial interfaces GPS SERIAL PORT A (SIRF BINARY) on pin connector X402 and MODEM SERIAL PORT 2 (GPS CONTROL) on pin connector X403 can also be directly attached to the PC. Cable adapters CAB-ROU-200 (CMOS-Level to USB) and CAB-ROU-210 (CMOS-Level to RS232) are available for this purpose.

Usable signals are available on the following plugs/male connectors in combinations of **STK-S4** and **AarLogic-A01** or **AarLogic-C01**:

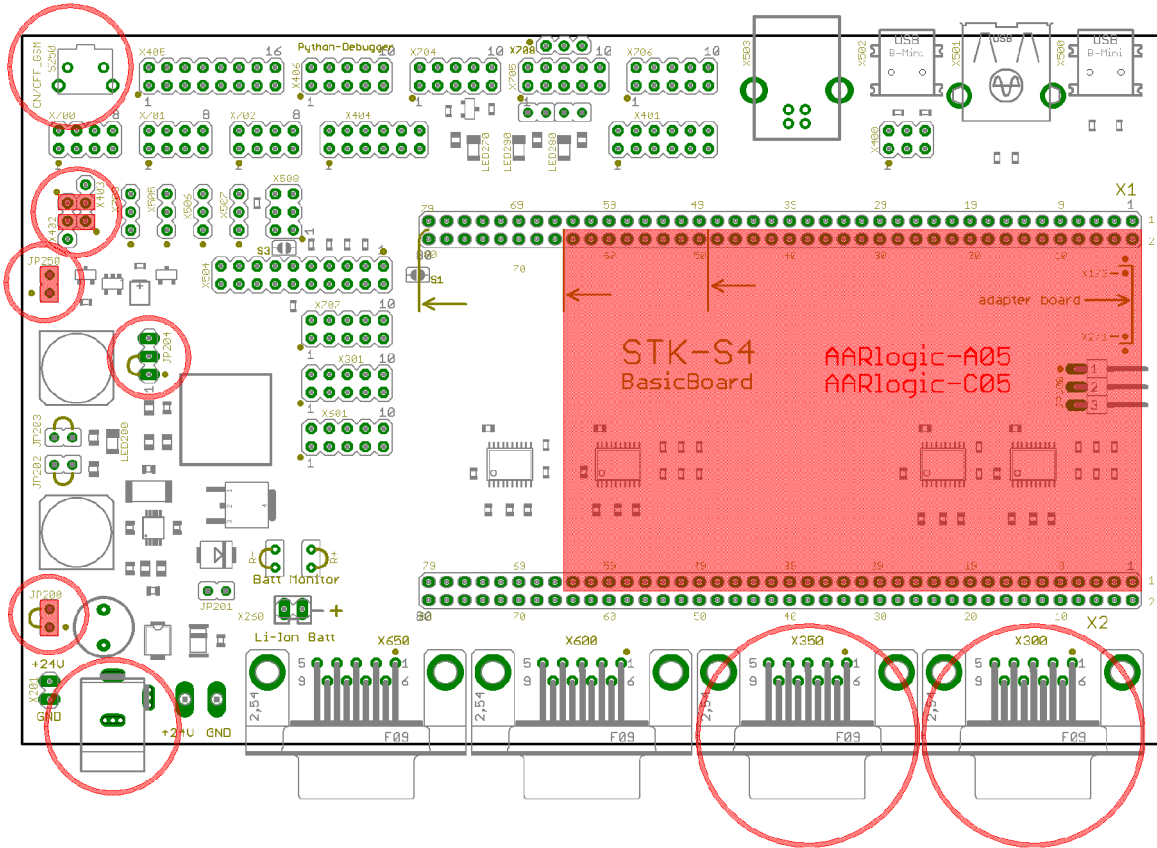
Name	Type	Function
X400	2 x 3 - Pin Connector	SIM-Card
X401	2 x 6 - Pin Connector	Audio-Signal
X402	1 x 3 - Pin Connector	GPS SERIAL PORT A (SIRF BINARY)
X403	1 x 3 - Pin Connector	MODEM SERIAL PORT 2 (GPS CONTROL)
X404	2 x 6 - Pin Connector	General (VRTC, RESET_GSM, PWRMON, VAUX1, ...)
X405	2 x 8 - Pin Connector	GPIO

Recommended Accessories:

- Plug-in Mains Power Supply 9V/1000mA, 3.5mm-Jack-plug

- GSM-Antenna including UFL Adapter Cable
- GPS-Antenna including UFL Adapter Cable
- Adapter Cable CAB-ROU-200 (CMOS-Level to USB)
- Adapter Cable CAB-ROU-210 (CMOS-Level to RS232)

2.4. Activation STK-S4 + AarLogic-A/C05



Baseboard **STK-S4** plus inserted Adapter Board **AarLogic-A05** or **AarLogic-C05**: The following settings should be chosen for fast activation:

Name	Type	Function	
X200	3.5mm Co-axial Plug	Power Supply	Plug-in Power Supply
X201	2.5mm-Pin Connector	6VDC ... 32VDC	Laboratory Power Unit
JP200	Jumper	Test Purposes	closed
JP201	Jumper	Power-Shut down of the DC/DC-Converter	closed
JP204	Jumper	Supply Voltage	Open
JP250	Jumper	GSM-Auto start	closed
X300	SUB-D	Serial (Main-)Interface	PC / Terminal program (9600/8/N/1)
X350	SUB-D	Serial Interface	PC / Terminal program (9600/8/N/1)

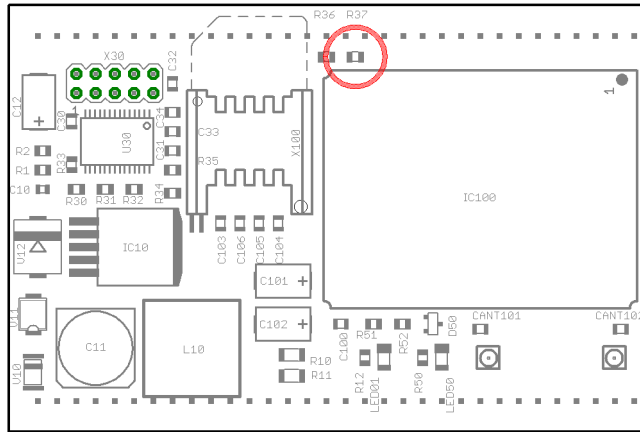
During set-up and operation the **AarLogic-A05** or **AarLogic-C05** adapter boards are broadly speaking similar to the 01 types (see above). Important differences however exist in relation to the Power Supply and the Serial (Main) Interface:

The **AarLogic-A05** or **AarLogic-C05** adapter boards have their own DC/DC Converter and are supplied from the STK-S4 Baseboard only with an unmodified operating voltage. The 4.0V (operation without battery) or 5.0V (operation with battery) operating voltage required by the adapter board is created on the board itself. This means that Jumper JP204 responsible for power supply on the STK-S4 must stay OPEN!

The 4.0V supply generated on the adapter board will however also be passed back to the STK-S4 so that the voltage is also available on the various male connectors and plugs.

Furthermore, the adapter boards **AarLogic-A05** or **AarLogic-C05** also have their own RS232-Interface Adapter (MAX3237). This is designated for stand-alone operation of the adapter board and must be deactivated when used on the STK-S4 Baseboard, otherwise it will operate in opposition to the corresponding interface adapter on the STK-S4.

This deactivation must be implemented on the Adapter Board: Resistor R37 must be bridged (solder in a 0Ω resistor or create a „solder leak“)



The resistor that requires bridging on the **AarLogic-A05** or **AarLogic-C05** lies next to the SIM-Card Holder and the Telit GE863-GPS.

CAUTION: When GPS information is to be read via the X300 interface both Jumpers on the male connector strips X402 and X403 must be bridged. The interfaces „MODEM SERIAL PORT 2 (GPS CONTROL)“ and „GPS SERIAL PORT A (SIRF BINARY)“ will thereby be looped. (TX_TRACE --> RX_GPS_BIN and RX_TRACE --> TX_GPS_BIN).

The serial interfaces GPS SERIAL PORT A (SIRF BINARY) on pin connector X402 and MODEM SERIAL PORT 2 (GPS CONTROL) on pin connector X403 can also be directly attached to the PC. Cable adapters CAB-ROU-200 (CMOS-Level to USB) and CAB-ROU-210 (CMOS-Level to RS232) are available for this purpose.

Usable signals are available on the following plugs/male connectors in combinations of **STK-S4** and **AarLogic-A05** or **AarLogic-C05**:

Name	Type	Function
X400	2 x 3 - Pin Connector	SIM-Card
X401	2 x 6 - Pin Connector	Audio-Signals
X402	1 x 3 - Pin Connector	GPS SERIAL PORT A (SIRF BINARY)
X403	1 x 3 - Pin Connector	MODEM SERIAL PORT 2 (GPS CONTROL)
X404	2 x 6 - Pin Connector	General (VRTC, RESET_GSM, PWRMON, VAUX1, ...)
X405	2 x 8 - Pin Connector	GPIO
X406	2 x 5 - Pin Connector	Python-Debugger

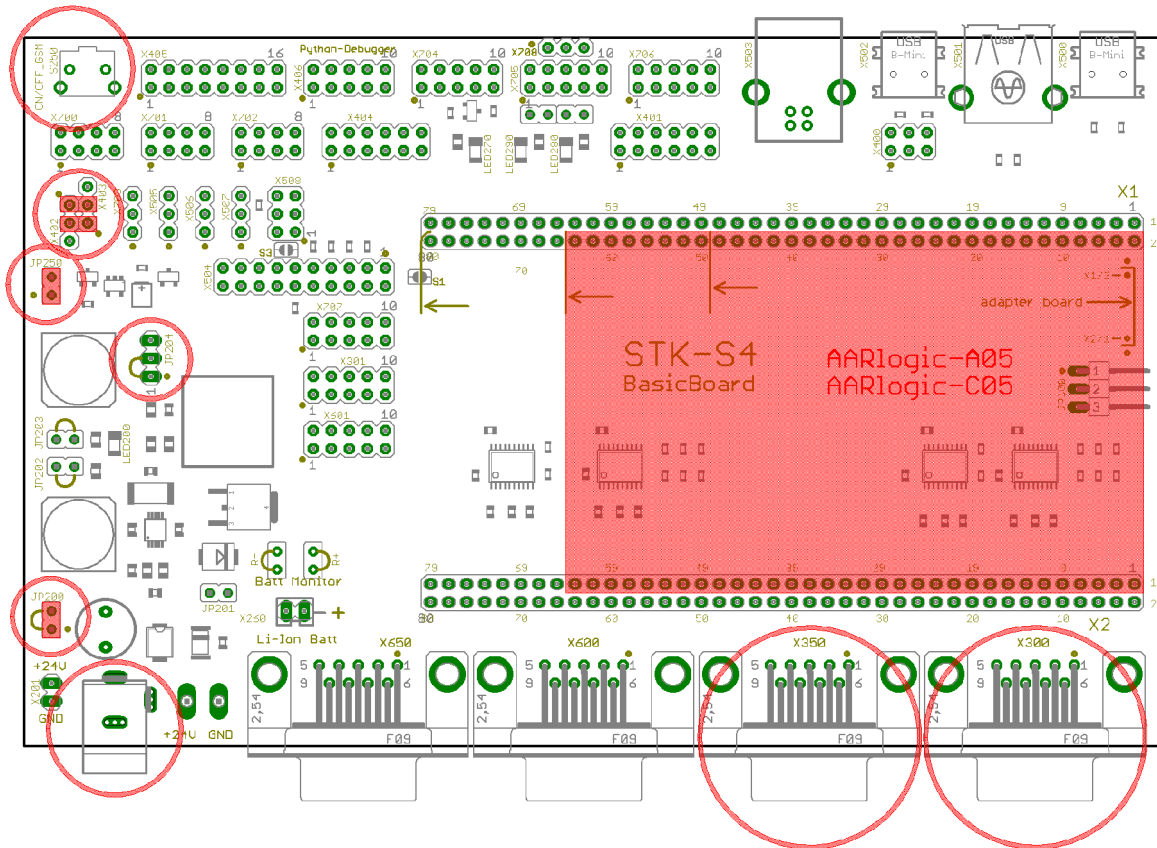
The Python Debugger makes a fast Debugging-Interface available and is essential for fast and safe programming in Python Script. The Python Debugger can be attached directly via the X406 Pin Connector .

Recommended Accessories:

- Plug-in Mains Power Supply 9V/1000mA, 3.5mm-Jack-plug

- GSM-Antenna including UFL Adapter Cable
- GPS-Antenna including UFL Adapter Cable
- Adapter Cable CAB-ROU-200 (CMOS-Level to USB)
- Adapter Cable CAB-ROU-210 (CMOS-Level to RS232)

2.5. Activation STK-S4 + AarLogic-C07/4



Baseboard **STK-S4** plus inserted Adapter Board **AarLogic-C07**: The following settings should be chosen for fast activation:

Name	Type	Function	
X200	3.5mm Co-axial Plug	Power Supply	Plug-in Power Supply
X201	2.5mm-Pin Connector	6VDC ... 32VDC	Laboratory Power Unit
JP200	Jumper	Test Purposes	closed
JP201	Jumper	Power-Shut down of the DC/DC-Converter	closed
JP204	Jumper	Supply Voltage	Open
JP250	Jumper	GSM-Auto start	closed
X300	SUB-D	Serial (Main-)Interface	PC / Terminal program (9600/8/N/1)
X350	SUB-D	Serial Interface	PC / Terminal program (9600/8/N/1)

Please remove all jumpers on the AarLogic C07/4 board. More details about the functions controlled by the jumpers on the C07 can be found in its dedicated manual "AarLogic-C07_4-manual.pdf".

During set-up and operation the **AarLogic-C07** board is broadly speaking similar to the 01 types (see above). Important differences however exist in relation to the Power Supply and the Serial (Main) Interface:

The **AarLogic-C07** adapter board has its own DC/DC Converter and is supplied by the STK-S4 Baseboard only with an unmodified operating voltage. The 4.0V (operation without

battery) or 5.0V (operation with battery) operating voltage required by the adapter board is created on the board itself. This means that Jumper JP204 responsible for power supply on the STK-S4 must stay OPEN!

The 4.0V supply generated on the adapter board will however also be passed back to the STK-S4 so that the voltage is also available on the various male connectors and plugs.

Usable signals are available on the following plugs/male connectors in combinations of STK-S4 and AarLogic-C07:

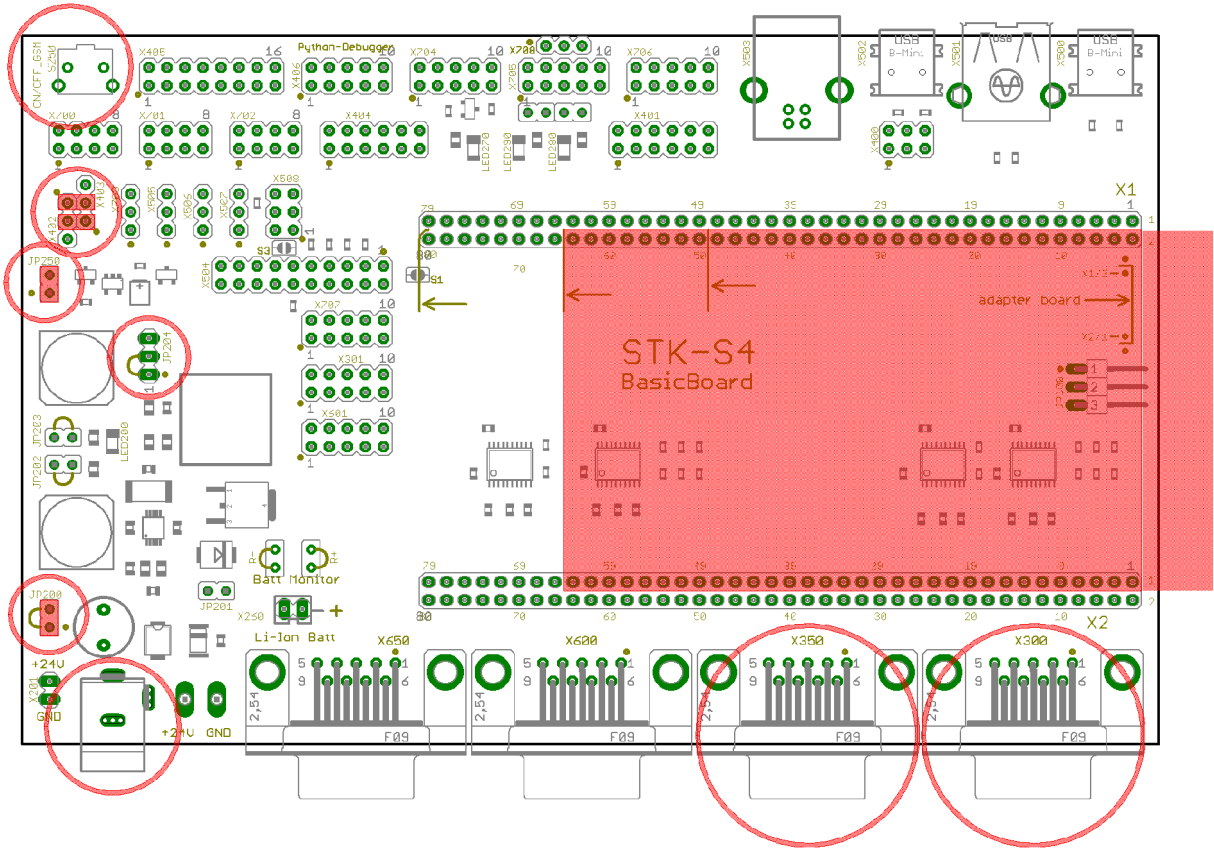
Name	Type	Function
X400	2 x 3 - Pin Connector	SIM-Card
X401	2 x 6 - Pin Connector	Audio-Signals
X402	1 x 3 - Pin Connector	GPS SERIAL PORT A (SIRF BINARY)
X403	1 x 3 - Pin Connector	MODEM SERIAL PORT 2 (GPS CONTROL)
X404	2 x 6 - Pin Connector	General (VRTC, RESET_GSM, PWRMON, VAUX1, ...)
X405	2 x 8 - Pin Connector	GPIO
X406	2 x 5 - Pin Connector	Python-Debugger

The Python Debugger makes a fast Debugging-Interface available and is essential for fast and safe programming in Python Script. The Python Debugger can be attached directly via the X406 Pin Connector .

Recommended Accessories:

- Plug-in Mains Power Supply 9V/1000mA, 3.5mm-Jack-plug
- GSM-Antenna including UFL Adapter Cable
- GPS-Antenna including UFL Adapter Cable
- Adapter Cable CAB-ROU-200 (CMOS-Level to USB)
- Adapter Cable CAB-ROU-210 (CMOS-Level to RS232)

2.6. Activation STK-S4 + Aarlogic M08/5 or M09/5



Baseboard **STK-S4** plus inserted Adapter Board **Aarlogic M08/5**: The following settings should be chosen for fast activation:

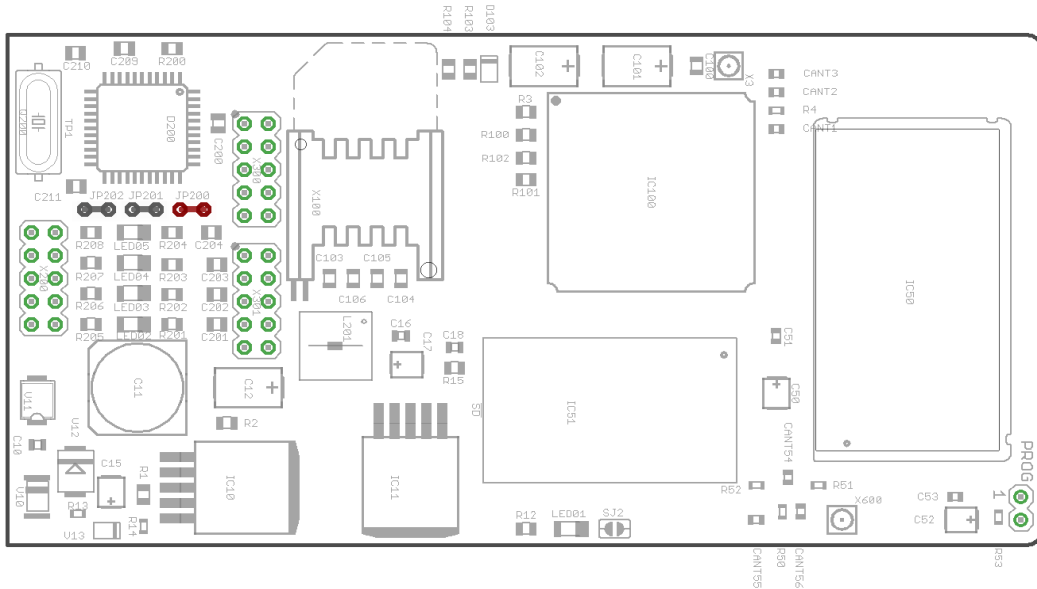
Name	Type	Function	
X200	3.5mm Co-axial Plug	Power Supply	Plug-in Power Supply
X201	2.5mm-Pin Connector	6VDC ... 32VDC	Laboratory Power Unit
JP200	Jumper	Test Purposes	closed
JP201	Jumper	Power-Shut down of the DC/DC-Converter	closed
JP204	Jumper	Supply Voltage	Open
JP250	Jumper	GSM-Auto start	closed
X300	SUB-D	Serial (Main-)Interface	PC / Terminal program (9600/8/N/1)
X350	SUB-D	Serial Interface	PC / Terminal program (9600/8/N/1)

During set-up and operation the **AarLogic-M0x** board is broadly speaking similar to the C01 types (see above). Important differences however exist in relation to the Power Supply and the Serial (Main) Interface:

The **AarLogic-M0x** adapter board has its own DC/DC Converter and is supplied by the STK-S4 Baseboard only with an unmodified operating voltage. The 4.0V (operation without battery) or 5.0V (operation with battery) operating voltage required by the adapter board

is created on the board itself. This means that Jumper JP204 responsible for power supply on the STK-S4 must stay OPEN!

The 4.0V supply generated on the adapter board will however also be passed back to the STK-S4 so that the voltage is also available on the various male connectors and plugs.



Set Jumper JP200 on the AarLogic M0x/5 board to disable the microcontroller and access the GE865 Serial Modem interface directly through X300 port of the S4. Aarlogic M0x/5 comes with a demo application installed.

Description of the M08/5 or M09/5 PCB:

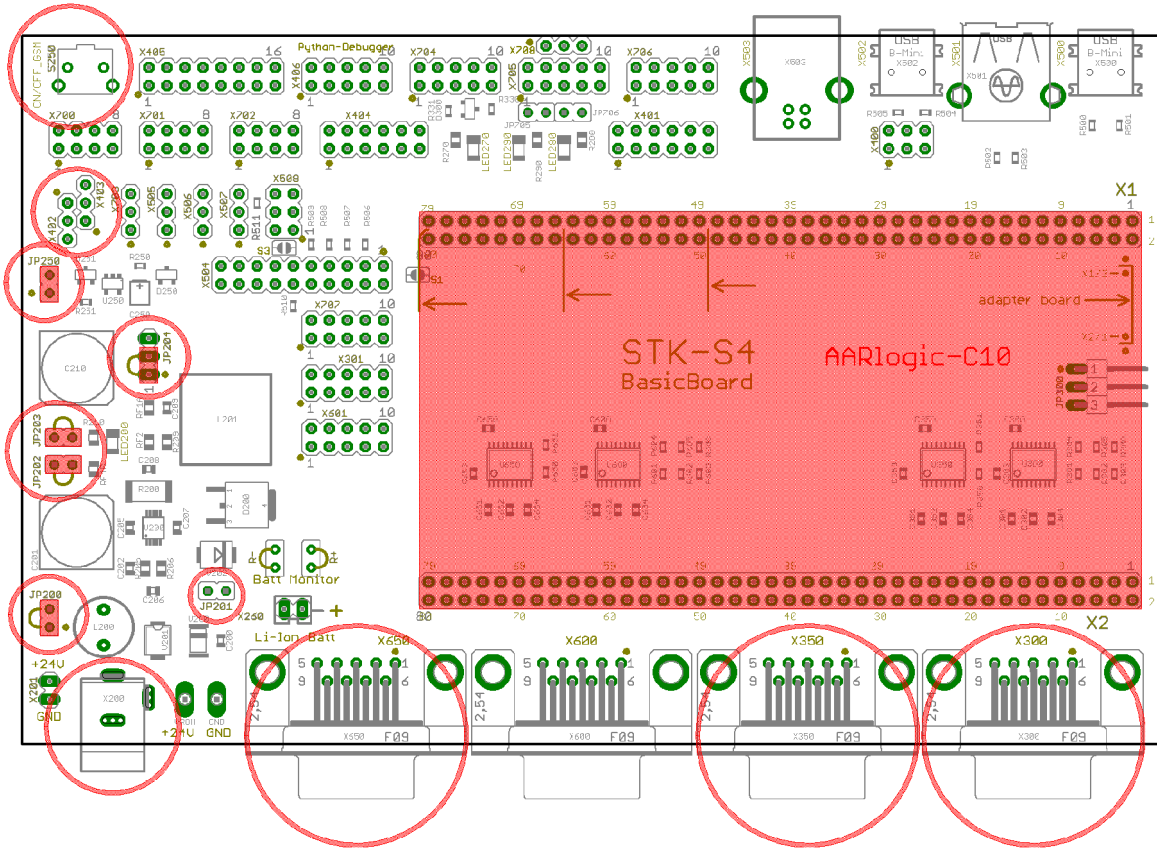
name	type	function
X100	Simholder	Simcard
X3	UFL	GE865- GSM RF-Input
X200	2*5 pol. Pin Row, 2,54mm	Input/Output (4 + 4)
X300	2*5 pol. Pin Row, 2,54mm	ISP-Programmer (10pol. standard)
X301	2*5 pol. Pin Row, 2,54mm	JTAG-Programmer (10pol. Standard)
X600	UFL	ISM - RF-Input
JP200	Jumper	GPIO Microcontroller PE0

Recommended Accessories:

- Plug-in Mains Power Supply 9V/1000mA, 3.5mm-Jack-plug
- GSM-Antenna including UFL Adapter Cable
- ISM868/915 Module for Gateway function e.g. Tiny One Lite, AMB8425 or NE50
- ISM -Antenna including UFL Adapter Cable
- Adapter Cable CAB-ROU-200 (CMOS-Level to USB)
- Adapter Cable CAB-ROU-210 (CMOS-Level to RS232)

2.7. Activation STK-S4 + AarLogic-C10/3

Baseboard **STK-S4** plus inserted Adapter Board **AarLogic-C10**:



The following settings should be chosen for fast activation:

Name	Type	Function	
X200	3,5mm Co-axial Plug	Power Supply	Plug-in Power Supply
X201	2,5mm-Pin Connector	6VDC ... 32VDC	Laboratory Power Unit
JP200	Jumper	Test Purposes	closed
JP201	Jumper	Power-Shut-down of the DC/DC-Converter	Open
JP202	Jumper	Power Limiting when Battery Charging up to 1000mA	closed
JP203	Jumper	Strength of the Board Voltage	closed
JP204	Jumper	Supply Voltage	1-2 closed
JP250	Jumper	GSM-Auto Start	closed
X300	SUB-D	Serial (Main-)Interface	PC / Terminal Program (9600/8/N/1)
X350	SUB-D	Serial Interface	PC / Terminal Program (9600/8/N/1)
X650	SUB-D	Serial Interface	PC / Terminal Program (115000/8/N/1)

A Telit-Module Type GE863-PRO³, a SIM-Card holder, a SD-Memory Card Slot and a GPS-receiver is located on the Adapter Board **AarLogic-C10**.

The Adapter Board does not have its own power supply. It is supplied by the **STK-S4-Baseboard** (4.0V, adjustable via Jumper JP202, JP203 and JP204)

Not all contacts on Pin Connectors X1 and X2 are used. For details see the wiring diagram of the **AarLogic-C10/3**.

Mobile Wireless Module

The Mobile Wireless Module found in the GE863-PRO³ broadly equates to the specification and operation of the GE863-QUAD. The serial interface of the Mobile Wireless Module is effected on the **STK-S4-Baseboard** via the plug connector X300 (RS232-Level).

Important Note: The Telit description refers to /dev/ttyS3 when connecting serial interface between Linux and GPRS module. On the AarLogic-C10/3 it is /dev/ttyS1 instead.

Accessing GPRS and GPS from Linux-System

You can access the GSM/GPRS Quadband module on /dev/ttyS1.

GSM Example: echo "AT+CREG?" > /dev/ttyS1
Asking for GSM registration status

GPS Example: cat /dev/ttyS4
Show NMEA strings generated by the GPS module

GPS-Receiver

A separate GPS-Receiver Type **AarLogic GPS 3M (101N1)** can be found on the Adapter Board. This receiver has two serial interfaces (Channel A and Channel B).

As a standard feature Channel A delivers NMEA-Data (9600/8/N/1) and is effected on the **STK-S4-Baseboard** via the plug connector X350 (RS232-level).

Channel B delivers binary data and lies on plug connector X-402 (CMOS-level). We recommend Adapter Cable CAB-ROU-200 (CMOS-level to USB) or CAB-ROU-210 (CMOS-level to RS232) or similar for switching ON the PC.

The GPS LED on the **STK-S4-Baseboard** is attached to the „Default Indicator“ (GPIO0) signal of the GPS-receiver. For details see Data Sheet.

Ethernet Adapter

The Professional Version of the AarLogic C10/3 Starter Kit comes with an Ethernet adapter. This adapter can be also be purchased in addition to the standard kit of the AarLogic-C10 (PCB-RS-ADB-ETHERNET).

The adapter works only with C10 boards newer than revision 5. Older revisions are not able to use the Ethernet adapter.

Hardware setup of the Ethernet Adapter:

1. Check revision of C10 (must be > Rev. 4)
2. Plug the adapter onto connectors X705 and X706 near to the USB connectors.

Software setup of the Ethernet adapter:

	<i>Telit Standard Linux</i>	<i>RS Linux</i>
Steps to activation	<ol style="list-style-type: none"> 1. Loading kernel module „macb“ (modprobe macb) 2. Setup of MAC address of the Ethernet adapter using command „ifconfig“ (See Telit Linux software guide for details) 	<ol style="list-style-type: none"> 1. MAC and IP address are setup with default values: IP: 192.168.1.1 2. If another IP address is needed the command „ifconfig“ can be used. <p>More details on using RS Linux can be found in</p>

	3. Setup IP address using command „ifconfig“	the RS-“Linux Step by Step“ guide
--	--	-----------------------------------

Application-Processor (AP)

As well as the mobile wireless component the GE863-PRO³ Telit-Module contains an integrated „ARM9 application processor“ (a ATMEL AT91SAM9260) with 4 to 64MB FLASH and 64 to 128MB RAM.

Note: All GE863-PRO³ version with less than 64MB Flash memory and 128 MB RAM are End of Life. All delivered AarLogic C10/3 boards rev.5 will come with 64/128 MB version.

A Linux-System (optional) is installed on this ARM9-platform. After Power-Up this system notifies itself to the serial interface X650 (Set-up 115000/8/N/1) as follows (newer hw. revisions might look slightly different):

```

CRC ok loading custom env

U-Boot 1.2.0 (Jul  1 2008 - 17:21:48)- 18 Telit

DRAM: 64 MB

Bank #1
DataFlash:AT45DB321
Nb min erasable unit: 8192
min erasable Size: 528
Size= 4325376 bytes
Logical address: 0xD0000000
Area 0:D0000000 to D0000FFF (RO) Primary Bootstrap
Area 1:D0001000 to D001CDFF (RO) U-Boot code
Area 2:D001CE00 to D0020FFF (RO) U-boot Environment
Area 3:D0021000 to D041FFFF User Area

In: serial
Out: serial
Err: serial
Hit any key to stop autoboot: 3 2 1 0
Reading from DataFlash... done
## Booting image at 20200000 ...
   Image Name: Linux-2.6.24-rc5-rt1
   Image Type: ARM Linux Kernel Image (uncompressed)
   Data Size: 1012368 Bytes = 988.6 kB
   Load Address: 20008000
   Entry Point: 20008000
   Verifying Checksum ... OK
   Loading Kernel Image ... OK

Starting kernel ...

Uncompressing Linux..... done, booting the kernel.
Linux version 2.6.24-rc5-rt1 (root@debian) (gcc version 4.2.1) #1 PREEMPT RT Thu Jul 17 16:59:40 CEST
2008 Telit-B0.01.09
CPU: ARM926EJ-S [41069265] revision 5 (ARMv5TEJ), cr=00053177
Machine: Telit CS1275
Memory policy: ECC disabled, Data cache writeback
Clocks: CPU 202 MHz, master 101 MHz, main 6.000 MHz
Clocks: MCK 101 MHz
CPU0: D VIVT write-back cache
CPU0: I cache: 8192 bytes, associativity 4, 32 byte lines, 64 sets
CPU0: D cache: 8192 bytes, associativity 4, 32 byte lines, 64 sets
Real-Time Preemption Support (C) 2004-2007 Ingo Molnar
Built 1 zonelists in Zone order, mobility grouping on. Total pages: 16256
Kernel command line: console=ttyS0,115200 mem=64M rootfstype=jffs2 root=/dev/mtdblock1 rw
mtdparts=spi0.1-AT45DB321x:1221k(ARMboot)ro,-@1221k(root)
WARNING: experimental RCU implementation.
AT91: 96 gpio irqs in 3 banks
PID hash table entries: 256 (order: 8, 1024 bytes)
Console: colour dummy device 80x30
console [ttyS0] enabled

```

```

Dentry cache hash table entries: 8192 (order: 3, 32768 bytes)
Inode-cache hash table entries: 4096 (order: 2, 16384 bytes)
Memory: 64MB = 64MB total
Memory: 62732KB available (1828K code, 200K data, 100K init)
Mount-cache hash table entries: 512
CPU: Testing write buffer coherency: ok
net_namespace: 76 bytes
NET: Registered protocol family 16
AT91: Power Management (with slow clock mode)
SCSI subsystem initialized
NET: Registered protocol family 2
IP route cache hash table entries: 1024 (order: 0, 4096 bytes)
TCP established hash table entries: 2048 (order: 2, 16384 bytes)
TCP bind hash table entries: 2048 (order: 3, 57344 bytes)
TCP: Hash tables configured (established 2048 bind 2048)
TCP reno registered
NetWinder Floating Point Emulator V0.97 (double precision)
krcupreemptd setsched 0
  prio = 98
JFFS2 version 2.2. (NAND) (SUMMARY) Â© 2001-2006 Red Hat, Inc.
io scheduler noop registered (default)
io scheduler anticipatory registered
atmel_usart.0: ttyS0 at MMIO 0xfefff200 (irq = 1) is a ATMEL_SERIAL
atmel_usart.1: ttyS1 at MMIO 0xffffb0000 (irq = 6) is a ATMEL_SERIAL
atmel_usart.2: ttyS2 at MMIO 0xffffb4000 (irq = 7) is a ATMEL_SERIAL
atmel_usart.3: ttyS3 at MMIO 0xffffb8000 (irq = 8) is a ATMEL_SERIAL
atmel_usart.4: ttyS4 at MMIO 0xffffd0000 (irq = 23) is a ATMEL_SERIAL
atmel_usart.5: ttyS5 at MMIO 0xffffd4000 (irq = 24) is a ATMEL_SERIAL
RAMDISK driver initialized: 1 RAM disks of 8192K size 1024 blocksize
PPP generic driver version 2.4.2
PPP Deflate Compression module registered
NET: Registered protocol family 24
atmel_spi atmel_spi.0: Atmel SPI Controller at 0xfffc8000 (irq 12)
mtd_dataflash spi0.1: AT45DB321x (4224 KBytes)
2 cmdlinepart partitions found on MTD device spi0.1-AT45DB321x
Creating 2 MTD partitions on "spi0.1-AT45DB321x":
0x000000000-0x00131400 : "ARMboot"
0x00131400-0x00420000 : "root"
m25p80 spi0.0: unrecognized JEDEC id ffffff
m25p80 spi0.2: unrecognized JEDEC id ffffff
m25p80 spi0.3: unrecognized JEDEC id ffffff
atmel_spi atmel_spi.1: Atmel SPI Controller at 0xffcc000 (irq 13)
at91_rtc at91_rtc: rtc core: registered at91_rtc as rtc0
AT91SAM9 Real Time Clock driver.
at91sam9_wdt: invalid timeout (must be between 1 and 16)
TCP cubic registered
NET: Registered protocol family 1
NET: Registered protocol family 17
tc_clksrc: tc0 at 12.625 MHz
JFFS2 write-buffering enabled buffer (528) erasesize (8448)
VFS: Mounted root (jffs2 filesystem).
Freeing init memory: 100K
Setting DMA Console
init started: BusyBox v1.6.0 (2008-07-17 16:55:00 CEST) multi-call binary

starting pid 239, tty "": '/etc/init.d/rcS'
Initializing mdev dynamic device directory ... done
<6>AT91SAM9 Watchdog disabled
Watchdog card disabled.
AT91SAM9260 GPIO register major 253

starting pid 353, tty '/dev/console': '/bin/sh'

```

A complete Linux-System is available from this point on.

The ARM9-Platform contains numerous interfaces and functions (for details see the GE863-PRO³-Data Sheet). Nearly all interfaces are delivered externally via plug connectors X1 and X2. Plug connector X504 is available for program development or respectively operation without Linux. A JTAG programmer can for instance be attached here. For further programming details please see the separate description.

In case no antennae are connected or when a GPS-Satellite has still not been recognised and the Mobile Wireless Module has still not logged into the GSM Network, must:

- the **GSM-LED** on the Adapter Board and LED270 on the **STK-S4**-Baseboard must flash slowly (= Signal „STAT_LED“ of the GE863-PRO³). After successful Log-On (Do not forget to insert the SIM-Card!), the GSM-LED flashes at 3 second intervals.

and

- the **GPS-LED** on the Adapter Board must flash quickly (= Signal „Default Indicator“ of the **AarLogic GPS 3M**). After the First Fix the GSM-LED flashes at one second intervals.

Usable signals are available on the following plugs/male connectors in combinations of **STK-S4** baseboard and Adapter Board **AarLogic-C10**:

Name	Type	Function
X400	2 x 3 - Pin Connector	SIM-Card
X401	2 x 6 - Pin Connector	Audio Signals
X402	1 x 3 - Pin Connector	GPS SERIAL PORT A (SIRF BINARY)
X403	1 x 3 - Pin Connector	MODEM SERIAL PORT 2 (GPS CONTROL)
X404	2 x 6 - Pin Connector	General (VRTC, RESET_GSM, PWRMON, VAUX1, ...)
X405	2 x 8 - Pin Connector	GPIO
X500	USB	AP: 1. USB-Host
X501	USB	AP: 1. USB-Host
X502	USB	AP: USB-Device
X503	USB	AP: USB-Device
X504	2 x 10 - Pin Connector	AP: JTAG
X505	1 x 3 - Pin Connector	AP: Debug Serial Port
X506	1 x 3 - Pin Connector	AP: COM_5
X507	1 x 3 - Pin Connector	AP: COM_4
X508	2 x 3 - Pin Connector	AP: COM_1

For detail see Wiring Diagrams for the **STK-S4**-Baseboard and **AarLogic-C10** Adapter Board.

Recommended Accessories:

- GSM-Antenna including UFL Adapter Cable
- GPS-Antenna including UFL Adapter Cable
- Adapter Cable CAB-ROU-200 (CMOS-Level to USB)
- Adapter Cable CAB-ROU-210 (CMOS-Level to RS232)
- JTAG Programmer (optional)