



Xamelo 100

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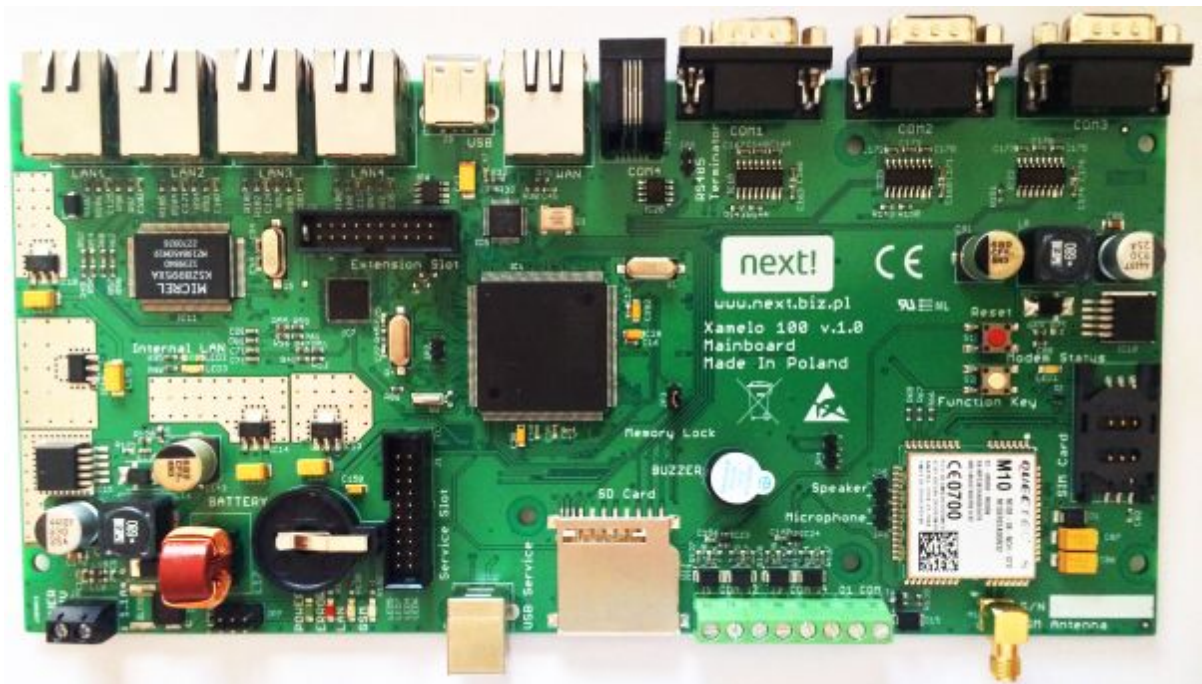
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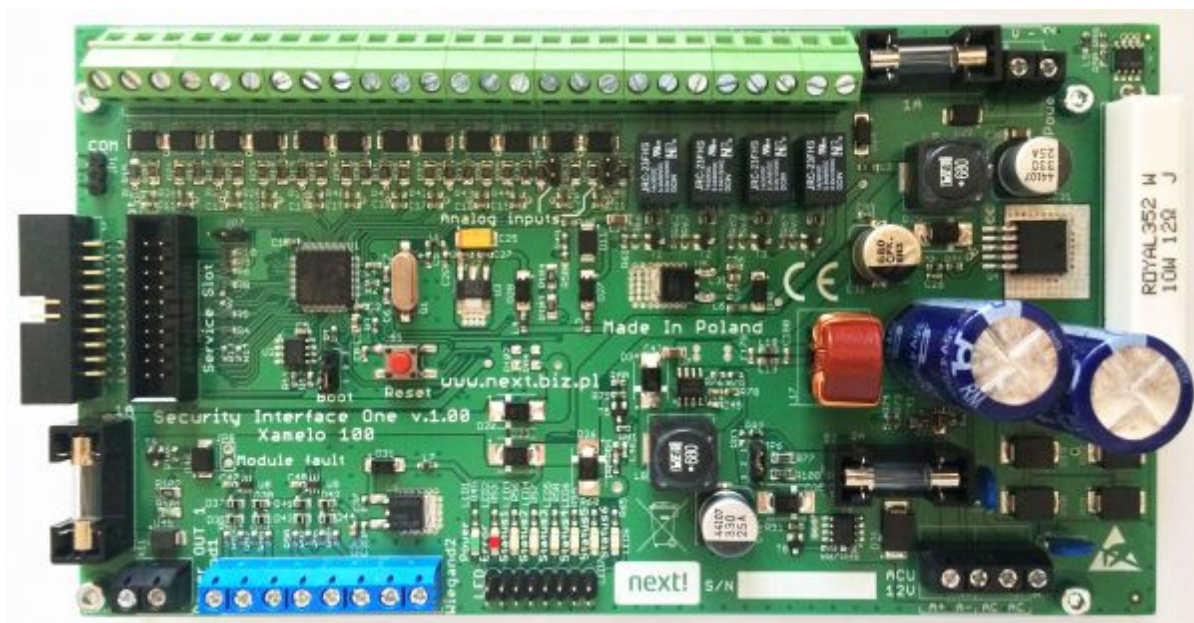
1 Introduction

Xamelo 100, together with its optional extension modules, is an innovative device designed for the monitoring and security market. Its basic function is to gather and transmit signals from various sources to a central control system, as well as enabling interaction between the central control system and devices connected to Xamelo 100. The device functions depend on the software installed, which in contrast to traditional solutions, are not an integral part of the device itself. This solution provides a wide spectrum for possible adaptation of the device to the specific demands of the user.

Xamelo 100 should be considered as an industrial computer designed for monitoring, but with intelligent routing functions and equipped with a range of standard input/output ports. The device meets all required norms for security systems and alarm transmission devices.



Main board



Extension module - Security Interface One (SIO)

2 Safety instructions

This documentation uses the following symbols:



Caution



Note

Before using the device please read the safety instructions below.

Incorrect operation or improper use of the device may cause serious damage to the device itself, or may result in injury.

The manufacturer takes no responsibility for any damage or injury caused by incorrect operation or improper use of the device.

- The device should be installed in its casing and kept in dry conditions.
- Device installation must ensure sufficient ventilation to prevent overheating.
- The ventilation holes must meet the following conditions:
 - there should be no ventilation holes on the bottom of the casing
 - holes of maximum 1mm diameter should be located on the top or sides of the casing
- The casing should only enable access to the battery compartment with the use of tools.
- The device must not be subject to extremes of temperature, humidity, vibration, shock or impact.
- Before use place the device on a stable, flat surface.
- Before connecting the device, ensure the GSM antenna is connected, as the device may be damaged if the antenna is not connected.
- Before connecting ensure that the power supply is connected correctly.

- Switch off the power before connecting any peripheral devices via the COM1-COM4 interfaces.
- Before using the device ensure that the user has no electrostatic charge by touching an earthed metal object.
- Ensure the device does not come into contact with any liquids as this may damage the device or may result in electric shock.
- The SD card must not be removed while the device is in use as this may damage the device or cause it to malfunction.
- The device clock battery should be installed according to the manufacturer's specifications.
- The battery should only be changed with the power supply switched off and the LAN and WAN ports disconnected.



Caution! The device may explode if a battery of the wrong type is used. Dispose of used batteries in the appropriate manner.



Lithium batteries should be recycled or disposed of according to national and local laws and regulations. To avoid fire or explosion, the batteries should not be exposed to naked flames.

If any of the following should occur, the device should be returned to the manufacturer:

- the device has come into contact with liquid
- the device has been subject to high humidity
- the device does not work properly, or it is impossible to start up the device following the instructions of use
- the device was dropped and damaged
- the device has clear signs of damage

3 Description

The main Xamelo 100 module is a miniature single board computer equipped with a powerful ARM9 processor, 64MB RAM memory, and 512MB NAND Flash memory.

The computer has the following communication interfaces:

- 1 x port USB 2.0 host
- 1 x port USB 2.0 device
- 3 x port RS232
- 1 x port RS485
- 1 x WAN 10/100Mbps
- 4 x LAN 10/100Mbps
- 4 NO/NC input
- 1 OC input

- a GPIO/I2C data bus for additional extension modules
- 1 x SD card slot
- GSM/GPRS 850/900/1800/1900 MHz Quectel M10 modem

The device is equipped with a GSM/GPRS modem with a SIM card slot, with the option of connecting a microphone and speaker, and the option of following PPP, TCP/IP, HTTP, FTP, MMS internet protocols.

The computer works using:

- Adeneo Embedded® Board Support Package (BSP), Copyright 2009 Adeneo. All Rights Reserved. This includes the Windows Embedded CE 6.0 R3 operating system and BIOS
- Distribution, Linux Angstorm, Kernel: 2.6.30



The computer does not have a graphics interface, access to the device is provided via communication interfaces.

Using a GPIO data bus the main module can work with extension modules.

The Security Interface One (SIO) extension module is an optional module which provides the basic interfaces that allow Xamelo 100 to be used as an independent security system for the protection of premises. These interfaces include:

- 12 input ports for alarm system sensors
- 4 output ports for transmission
- 2 Wiegand ports



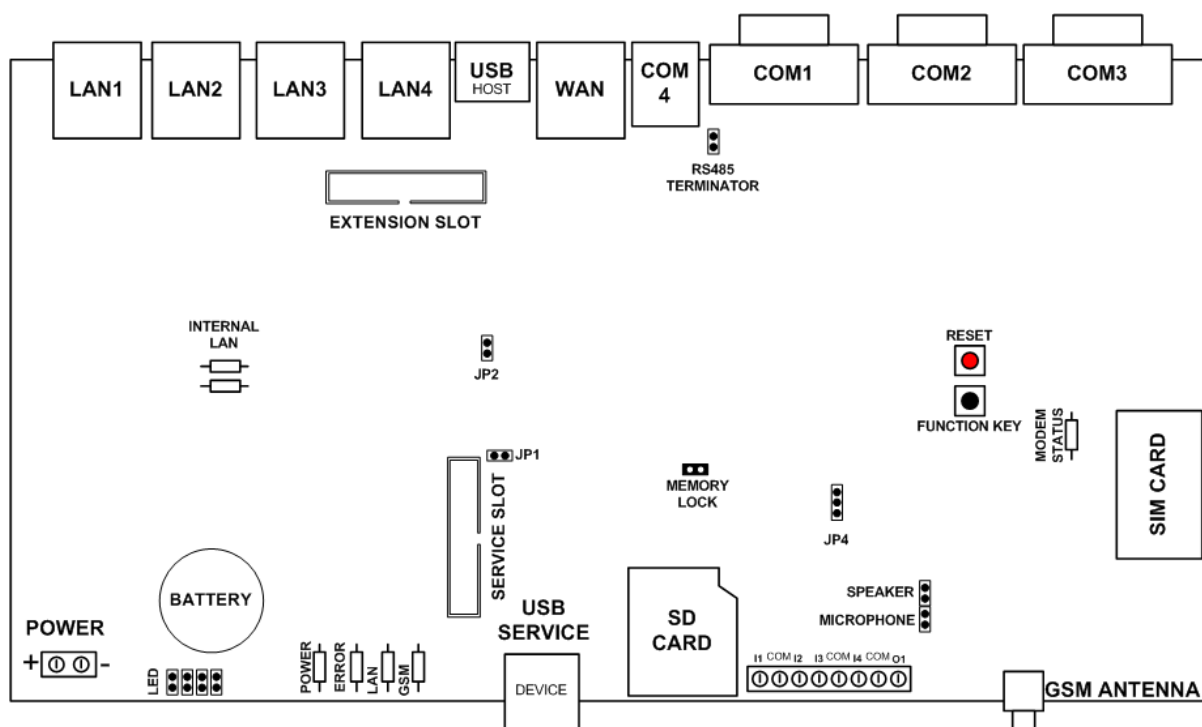
Device functionality depends on the software installed and is described in separate instructions of use.

4 Xamelo 100 Parameters

The Xamelo 100 comes equipped with:

- the Xamelo 100 device
- Maxell CR2032 batteries
- an SD card
- device instructions

Layout of the Xamelo 100 device interfaces:



Name	Description
POWER +/-	Direct current 10V ÷ 24V, average/max current - 0,5A/0,7A
WAN	External LAN network interface
USB	USB interface for additional devices
LAN1-4	Internal LAN network interface
SIM Card	Full size SIM card slot
GSM Antenna	GSM modem SMA antenna socket
COM1-3	RS232 interfaces for integrated devices
COM4	RS485 interface for integrated devices via an RJ11 port, (active pins 3 and 4)
Reset	Device reset button
Function Key	Programmable function button
I1 - I4	Programmable NO/NC ports
O1	Programmable OC output, maximum load 50mA
USB Service	USB Device interface for connecting devices to the computer for servicing
SD Card	SD card slot (max 4GB)
BATTERY	3V CR2032 device clock battery socket
Extension Slot	GPIO/I2C data bus for additional extension modules
Service Slot	20 pin JTAG service socket for programming the device processor
Memory Lock	Lack of jumper switches the processor into programming mode
RS485 Terminator	According to standards, an RS485 terminator should be installed at either end of the line na obu brzegach linii
Microphone	Socket for connecting an external microphone to the GSM modem

Speaker	Socket for connecting an external speaker to the GSM modem
LED	Socket for connecting the Power, Error, LAN and GSM diodes on the outside of the casing
Jumper JP2	Not used
Jumper JP4	Not used





Diode	Diode colour	Status	Description
	POWER (green)		Correct device operation
	ERROR (red)		Internal software problem
	LAN (orange)		Correct connection via WAN
	GSM (orange)		Correct connection via GSM modem



The meaning of the diode descriptions above may vary depending on the system version and on the software.

Diode	Diode colour	Status	Description
			Modem not working
	YELLOW		Modem not synchronized with the network
			Modem synchronized with the network
			Data transfer via GPRS in progress

Diode	Diode colour	Status	Description
			Additional LAN (Internal) inactive due to lack of drivers

	GREEN		Data transfer in progress
	ORANGE		Connecting

5 Device connection

Before connecting the device, read the [Safety instructions](#).



The device is not designed to be installed outside. The antenna, and distribution and telecommunication cables cannot be subjected to power surges.

Before starting up the device, ensure the GSM antenna is connected, and the SD card and clock battery are installed.



The device may be damaged if the GSM modem antenna is not connected!

The Xamelo 100 device is powered by direct current 10V ÷ 16V, with an average current of 0,5A during operation, and a maximum of 0,7A.

Connecting the device:

- Install the device according to the [Safety instructions](#).
- Connect the optional peripheral devices to the COM1 - COM4 interfaces
- Connect the power supply to the POWER socket ensuring the correct polarity (+ and -)



The device should be equipped with a readily accessible power interruption device.



Installation and connection of peripheral devices must be done with the power supply disconnected!

For direct current power supply, the manufacturer recommends using the *Security Interface One* (SIO) extension module with in-built **rectifier system**.

Details of how to connect the power supply are described in the chapter [Power supply via SIO extension module](#).

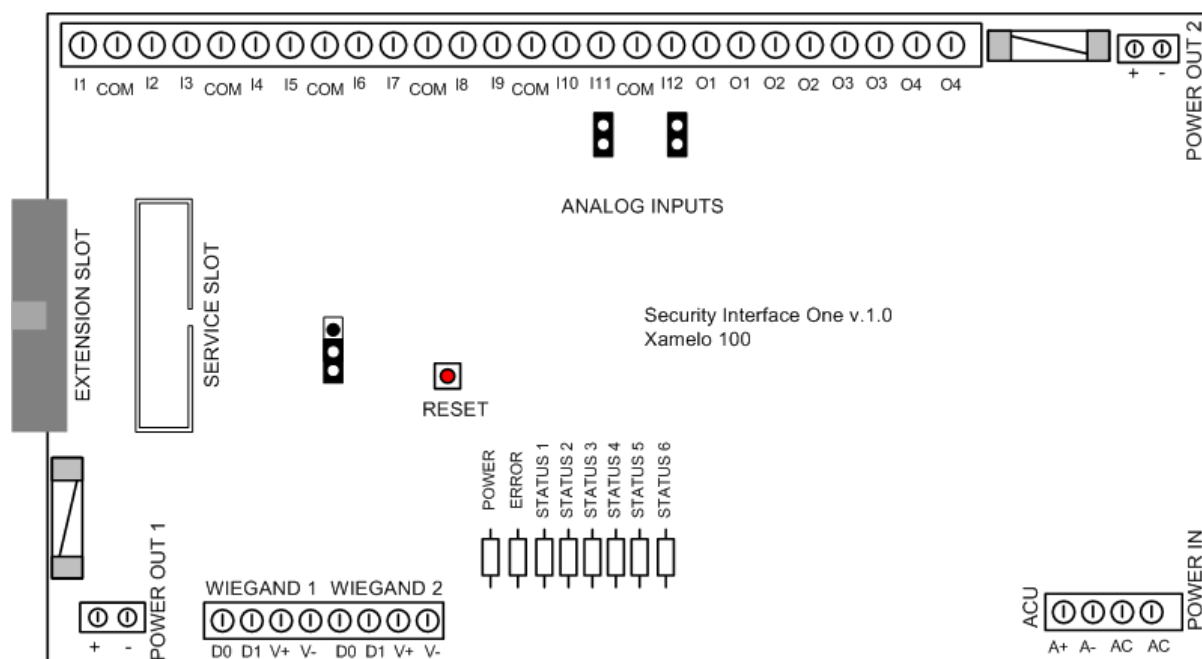
6 SIO Extensions Module

The optional *Security Interface One* (SIO) extension module extends the microcomputer's functionality with additional interfaces, power supplies, and input and output ports.



The extension module is equipped with an independent CPU unit and operating memory.

Layout of the Security Interface One extension module:



Name	Description
Power IN AC	16V AC current socket
ACU A +/-	Emergency power socket - 12V battery (+ and -)
Power OUT1 +/-	Main module power out socket - 10 - 22 V DC
Power OUT2 +/-	Alarm system sensor power out socket - 10 - 14 V DC
I1 - I12	Alarm system sensor inputs
O1 - O4	Programmable transmission outputs

POWER	LED diode indicating correct device operation
ERROR	LED diode indicating SIO module internal error
STATUS1-6	Programmable LED diodes depending on the Xamelo 100 module software version
WIEGAND 1-2	Wiegand interface for connecting manipulators or readers
EXTENSION SLOT	GPIO/I2C data bus for connection to main module
RESET	Device reset button



When connecting the SIO extension module to the main Xamelo 100 module, ferrites must be used on the following cables:

- for GPIO/I2C tape, ferrite with the following recommended parameters: 35Ω (for 25Mhz), 88Ω (for 100Mhz)
- for Power OUT1 power supply, ferrite with the following recommended parameters: 53Ω (25Mhz), 86Ω (100Mhz)

The I1-I12 inputs can be configured as:

- NO/NC
- 2EOL
- 3EOL
- analogue 0-255 (only I11 and I12)
- active/inactive



The resistors installed for the 3EOL inputs should have a tolerance of 1%.

Jumpers:

JP3

- open - input I11 operates in analogue mode
- closed - analogue mode is inactive

JP4

- open - input I12 operates in analogue mode
- closed - analogue mode is inactive

JP1 - port COM UART (3,3V)

- 1 - GND
- 2 - TXD
- 3 - RXD

JP2 - select boot mode

- 1-2 normal operation

- 2-3 activate bootloader

JP6 - maximum battery charging current:

- 1-2 - 0,7A
- 2-3 - 1A

JP7

- open - switch on battery tests
- closed - switch off battery tests

The Xamelo 100 microcomputer is connected to the extension module via the socket *Extension Slot*, with a 20-pin wire cable.

6.1 Power supply via SIO extension module

The Security Interface One extension module can also be used to power the main Xamelo 100 module as well as alarm system sensors.

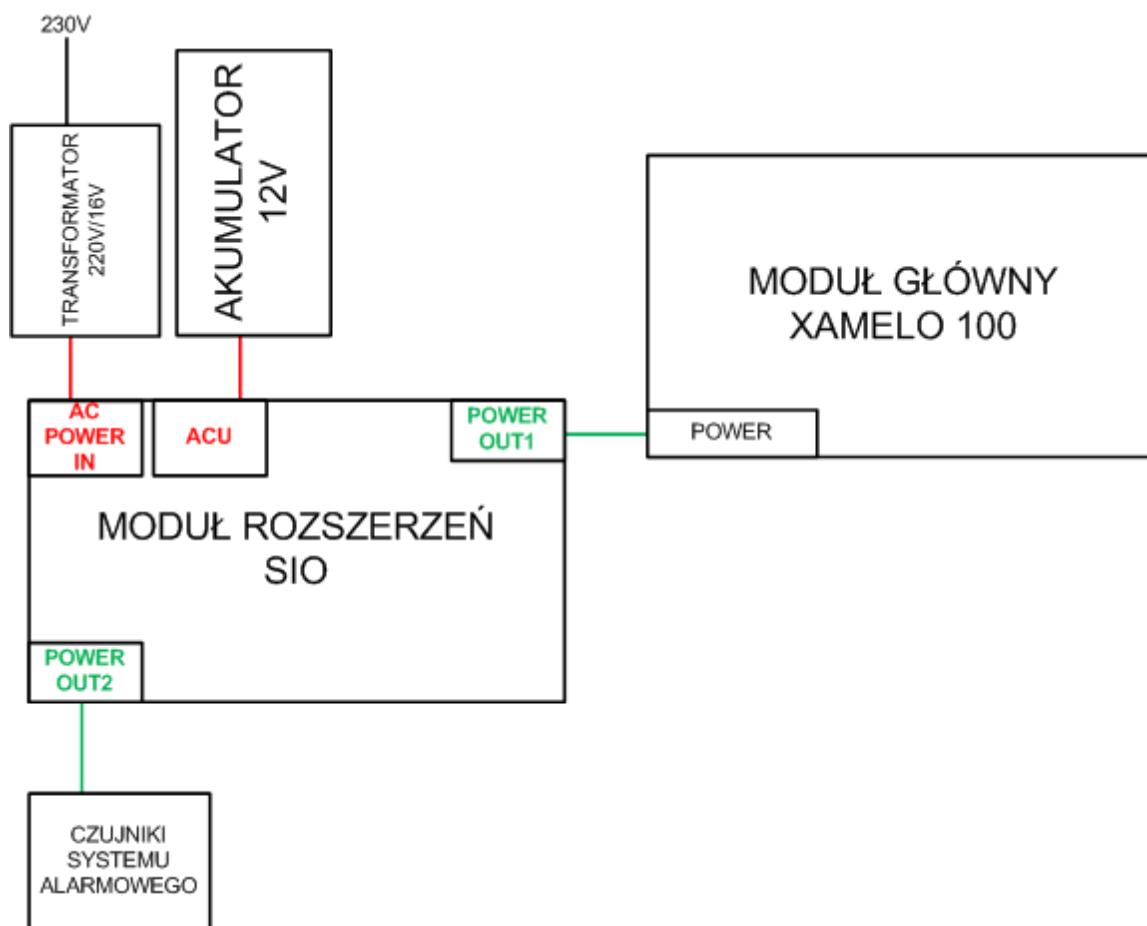
It is powered by 14-16V AC, or in emergencies by the 12V battery.



Never dispose of used batteries together with general waste.
The batteries must be left at special waste collection points.

The module has two DC power outputs for powering the main Xamelo 100 module and alarm system sensors.

Layout of power supply using the SIO extension module



Power supply connection procedure:

1. Connect the 14-16V **uzwojenia wtórnego** transformer terminals to the Power IN AC terminals.
2. Connect the battery to the dedicated cables (red to ACU A+, black to ACU A-)
3. Prepare the Xamelo 100 device according to the instructions in [Device connection](#)
4. Connect the *Power OUT1* socket to the *Power* socket for the main module (Xamelo 100), ensuring the correct polarity on both devices (+ and -)
5. Connect the transformer to the 230 V AC power supply.

The main Xamelo 100 device and the SIO extension module should both be in operation.

7 System installation

The device is supplied with the manufacturer's software installed.

A description of the software is available in a separate document.

The description below relates to individual tailor-made software solutions.

7.1 Windows CE installation

Once the power supply has been connected, the software can be installed on the device.

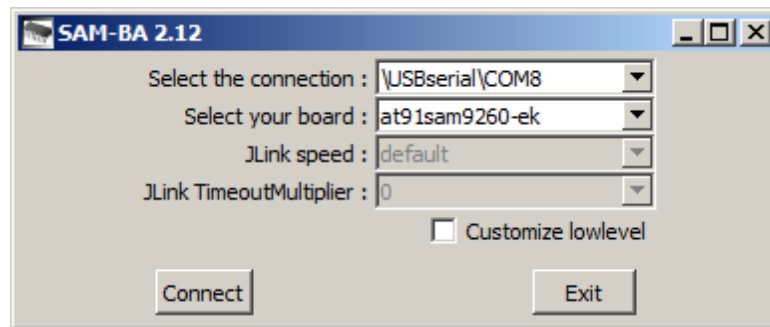
■ Preparing the device for the software

1. Connect the device via the *USB Service* port to a computer with Windows XP/Vista/7 operating system.
2. Remove the *Memory Lock* jumper
3. Connect the power supply to the *Power* socket according to the instructions, and Windows will automatically find and install the necessary device drivers.
4. Launch the Atmel SAM-BA processor programmer



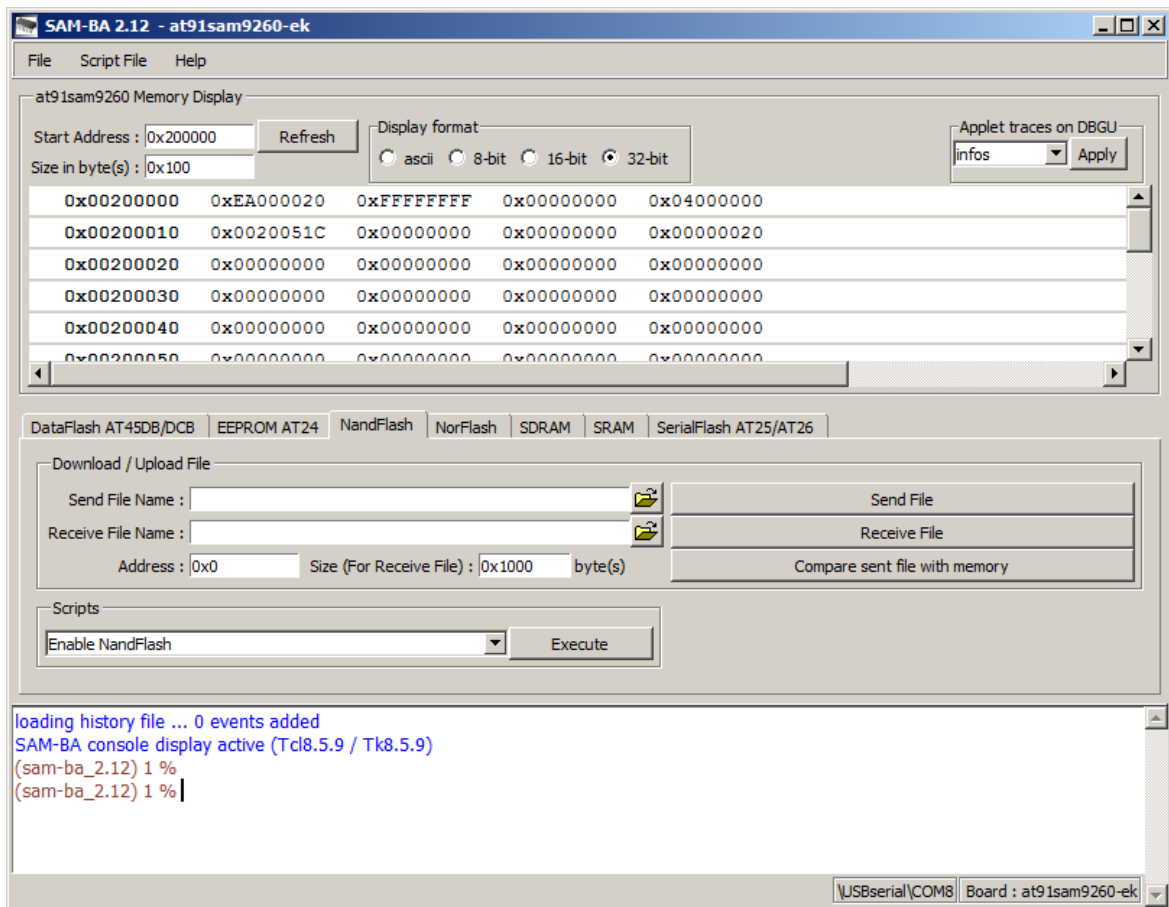
An up-to-date version of the programmer can be downloaded from the manufacturer's website:
<http://www.atmel.com/tools/ATMELSAM-BAIN-SYSTEMPROGRAMMER.aspx>

5. Select the recognised connection port ("/USBserial/comXX") and the disc AT91SAM9260-EK

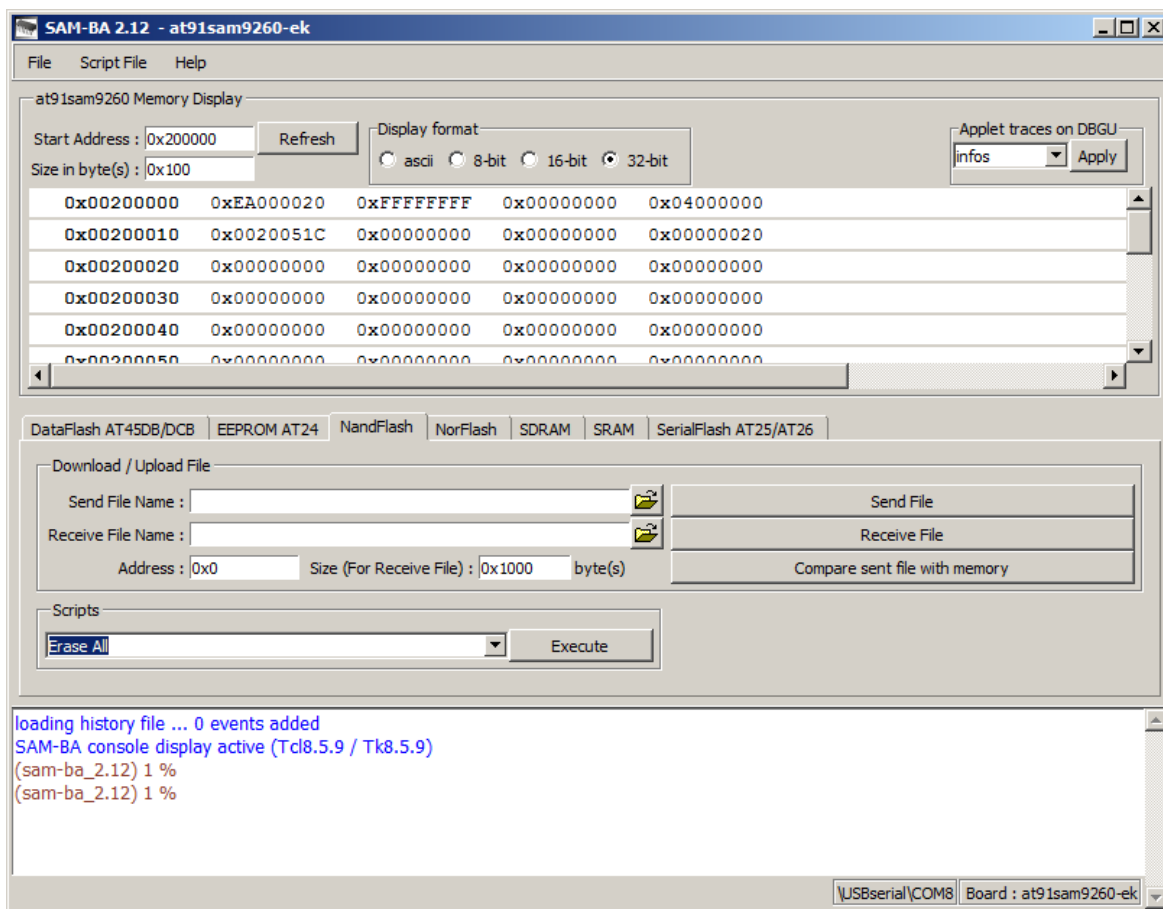


If the default port is not recognised, the device has probably not been installed correctly. In this situation the device drivers must be reinstalled. These are available in the SAM-BA programmer installation catalogue.

6. Confirm your choice, and after launching the application, replace the *Memory Lock* jumper.
7. Select the *NandFlash* tab.



8. Select „Enable NAND” from the options and then *Execute*
9. Clear the device NAND memory by selecting *Erase All* → *Execute*



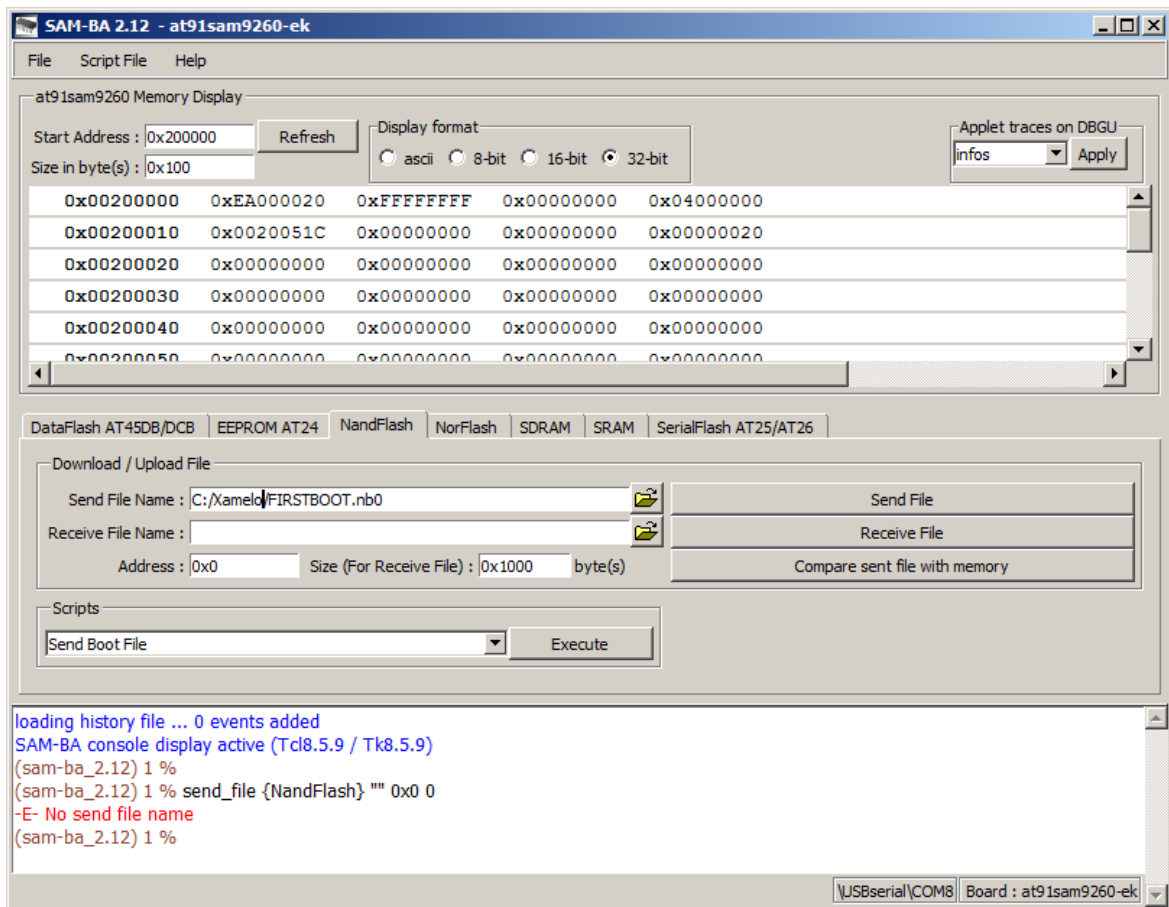
The clear memory option completely removes the data from the device NAND memory. This step is recommended during first system installation.

The device is ready to receive new software.

■ Installing software

1. Save the first level bootloader:

- select *Send Boot File* → *Execute* from the list
- set the *Address* as 0x0
- select the bootloader file *Firstboot.nb0*
- send the file using the option *Send File*



The lowest level bootloader is used to launch the more advanced second level bootloader.

3. Save the second level bootloader:

- select *Send Boot File* → *Execute* from the list
- set the *Address* as 0x80000
- select the bootloader file *ebboot.nb0*,
- send the file using the option *Send File*

4. Save the WinCE 6.0 system picture:

- select *Send Boot File* → *Execute* from the list,
- set the *Address* as 0x200000
- select the bootloader file *NK.nb0*,
- send the file using the option *Send File*



When saving the software, do not disconnect the device power supply as this may damage the device irreversibly.



Saving the system may take several minutes.



For a compilation of the new NK.nb0 file, enter the appropriate addresses into the second level bootloader (EBOOT.nb0). These addresses can be found in the „output” window during compilation, or in the file makeimg.out”.

The addresses must be entered using EBOOT source code, and the file which requires editing is eboot_cfg.c

7.2 Linux installation

To install Linux software, contact the device manufacturer.

8 Device configuration

The computer does not have a graphics interface, as a result configuration of the system is carried out remotely.

▣ Configuration of device with WIN CE

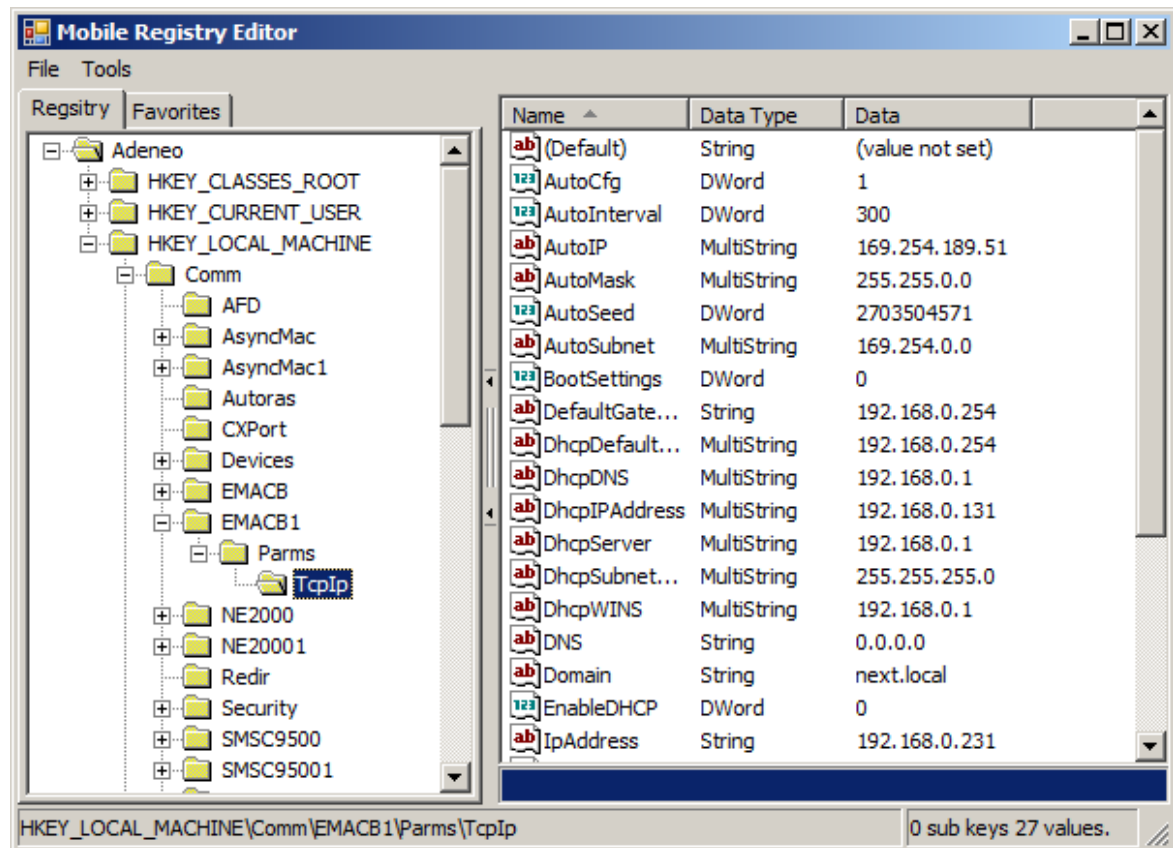
Remote access is possible using CERHost tools, while MobileRegistryEditor tools allow remote editing of the device registry itself.



The tools require installation of ActiveSync for mobile devices (Windows XP) or the WMDC package (for Windows Vista/7)

To configure the MAC address and the device network address:

1. Connect the working device via *USB Service* to a computer
2. Launch the tools MobileRegistryEditor.exe and the registry of the device will be read.



3. Edit the key values for the MAC address on the branch HKEY_LOCAL_MACHINE -> Comm -> EMACB1 -> Parms
 - NetworkAddress - MAC address
4. Edit the key values for the network card on the branch HKEY_LOCAL_MACHINE -> Comm -> EMACB1 -> Parms -> TcpIp
 - EnableDHCP - enable address download from DHCP server
 - IpAddress - manually entered IP address
 - Subnetmask - manually entered network mask
 - DefaultGateway - manually entered network gate
5. Once you have entered the changes, restart the device.

- ❑ **Configuring devices with Linux**
To configure a device with Linux software, contact the device manufacturer.

9 Technical information

9.1 Xamelo 100

Xamelo 100 device technical data:

Parameter	Value
Communication interfaces	RS232 / RS485 / Ethernet (LAN) / Ethernet (WAN) / GSM
External memory	Dependant on capacity of SD card in the device
Optical indicators	YES, device status
Audio indicators	YES, information about command issued
Recommended power supply	10V ÷ 24V DC; average (during operation)/ max - 0,5A/0,7A
Device clock battery type	CR2032 3V
OC (01) output load	50 mA
Range of operating temperature	5°C ÷ 40°C
Dimensions (length x width x height)	244 x 119 x 200 mm
Weight	~230 gr

Components

Microcontroller Atmel AT91SAM9	<ul style="list-style-type: none"> • ARM926EJ-S Core processor with clock frequency of 200MHz • 8 kB Cache memory for data and instructions • 8 kB SRAM internal memory • 32 kB ROM internal memory
SDRAM memory	64MB SDRAM memory
NAND Flash memory	512MB NAND Flash memory
Emergency battery power	CR2032 battery for maintaining actual RTC time.
Data bus GPIO/I2C	Data bus for the external extension module
Modem GSM Quectel M10	Integrated GSM/GPRS modem via an internal RS232 interface, working at the frequencies: 850/900/1800/1900MHz
USB hub	USB port concentrator
Switch	Ethernet port switch
RS232	Normal DB9 interface socket (not TTL) - 5 wire Normal DB9 interface socket (not TTL) - 5 wire Normal DB9 interface socket - 3 wire
RS485	Half-duplex RJ11 interface

Interfaces

Maximum cable length

NO/NC lines	100 m
GPIO/I2C	15 cm, recommended ferrites 35Ω (25Mhz), 88Ω (100Mhz)
USB	1.5 m
RS232	5 m
RS485	100 m at 100Kb/s
WAN	twisted cable category 5 or higher - 100 m
LAN	twisted cable category 5 or higher - 100 m
power cable	2 m

9.2 SIO

Security Interface One (SIO) extension module technical data:

Parameter	Value
Communication device<->Xamelo 100	GPIO data bus
Event buffer	512 events recorded in a loop
Optical indicators	YES, device status
Audio indicators	none
Power supply	16V AC
Battery voltage (ACU)	12 V
Fuses	1A 250 V
Output voltages:	
PowerOUT1	10...22 V DC
PowerOUT2	10...14 V DC
Wiegand1 ±	10...14 V DC
Wiegand2 ±	10...14 V DC
Load:	
Transmission outputs (01-04)	1A/24V DC, 0,5A/125V AC
PowerOUT1 power output	0,9 A
PowerOUT2 + Wiegand1 + Wiegand2	0,9A 0,9 A
Maximum current for battery charging	1 lub 0,7 A
Battery malfunction voltage warning	11 V ±10%
Battery disconnection voltage	10,5 V ±10%
Range of operating temperature	5°C ÷ 40°C
Dimensions (length x width x height)	184 x 108 x 47 mm

Interfaces	Maximum cable length
sensor inputs	

NO/NC	100 m
2EOL	100 m
3EOL	100 m
analogue (i11, i12)	5 m
Wiegand	2 m
GPIO/I2C	15 cm, recommended ferrites 35Ω (25Mhz), 88Ω (100Mhz)
COM (UART)	3 m
Power cable	2 m

9.3 Norms

The Xamelo 100 device and SIO extension module adhere to the following norms:

- EN50136-1:2012 Norm for alarm transmission systems level 3
- EN60950 IT devices. Safety.
- EN50082-1 Electromagnetic compatibility.
- Environmental class according to EN50130-5 level I

The concentrator meets requirements for alarm transmission according to the class (norm: PN50131-1-2006):
transmission time D3 (20 seconds)
maximum transmission time M3 (60 seconds)
report time T4 (180 seconds)
safety S2
data security I3.

To ensure that all the above norms are met, it is necessary for all elements of the system to also meet the norms. This is particularly important for power supplies, which must be connected via the alarm system console.

