



KGSM-40 INSTALLATION GUIDE

KGSM-40 DESCRIPTION

The GSM board of Khomp is destined for the CTI (Computer & Telephone Integration) market, and is equipped with up to four GSM modules. The boards have optional recourses such as echo cancellation, H 100 bus interconnection. The image below shows a summary of the most important components of the board:

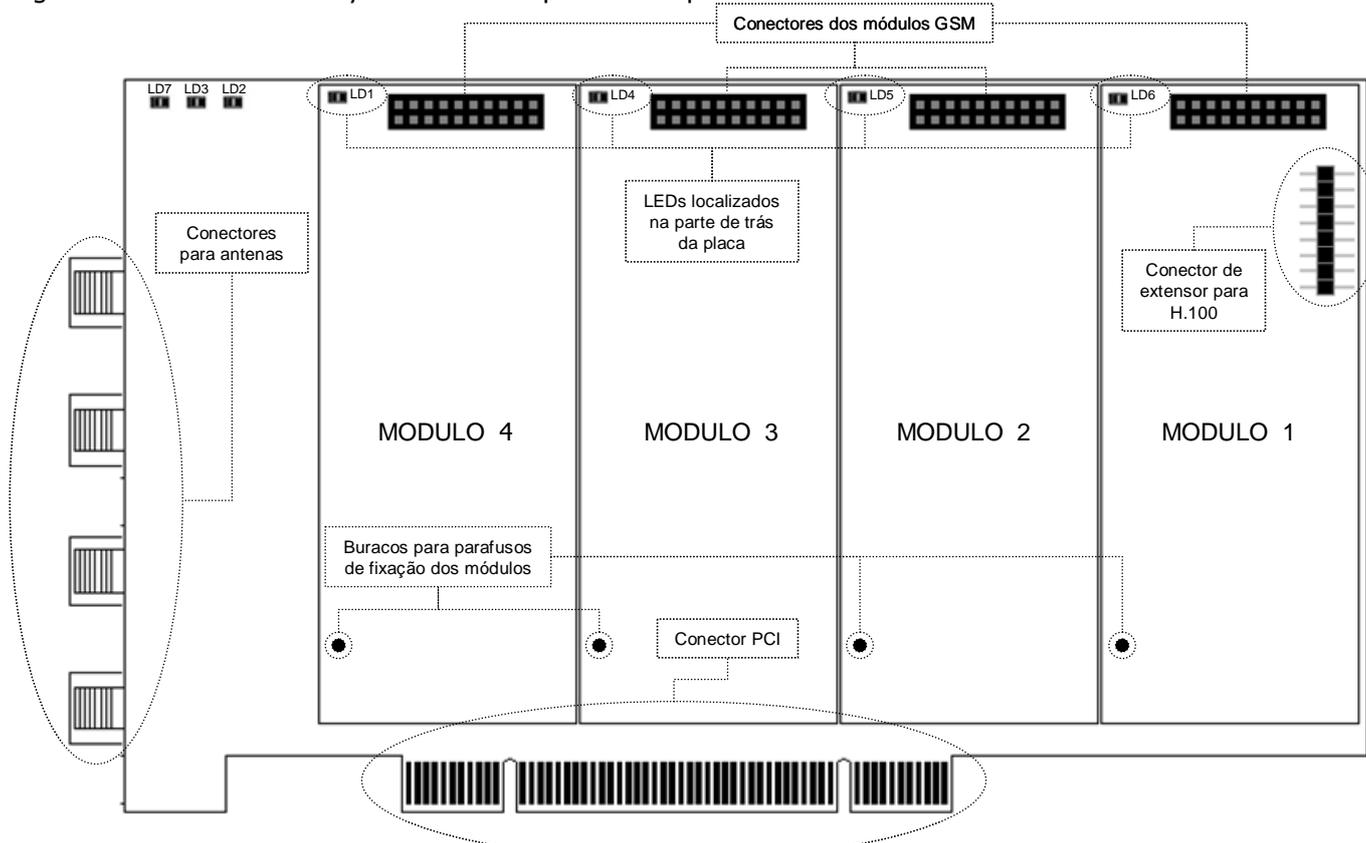


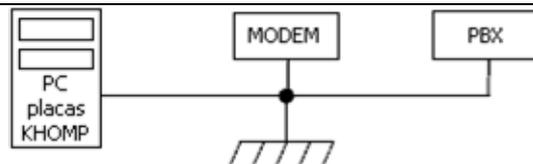
Figure: Connectors e jumpers

BOARD COMPONENTS:

- **Connectors for antennas:** To connect to the mobile network, the board needs external antennas, that are fixed in the connectors located in the front panel of the board, as mentioned in the figure above;
- **Connectors for the daughter cards:** The boards are deployed with the modules already fixed to de base card; however, the modules can be sold separately, allowing a modular expansion of the system. In this case it is necessary to fix the GSM module (daughter cards) to the base card, and screw it in the place signaled on the module.
- **LEDs:** The boards have two sets of LEDs. In the first set are the internal LEDs *L7*, *L2* and *L3*, located in the surface of the board. The other set has four LEDs: *LD1*, *LD4*, *LD5* and *LD6*, located behind the board. The chapter *UNDERSTANDING LEDs* explains their functionality.

GROUND

The first concern of Telecom equipment installation is about the ground reference. The computer that will receive the board, the no-break, the modem, the PBX and all Telecom equipment involved **MUST** have a valid and uniform ground reference. The figure shows an example of a valid ground reference linked to all equipment. The non-fulfillment of this requirement may result in calls with noise and a malfunctioning board.



Valid ground reference on the PC, the modem, and the PBX.

INSTALLING THE DRIVER

The board device driver is deployed in a package called K3L. The K3L installer provides, drivers, documentation and tools for operation and administration of the boards.

The current version of K3L is available on the Khomp's site, in the download area. Select the proper operating system of your platform in order to download the correct installer.

To download Khomp software you will need a valid username and password provided by Khomp. Contact Khomp if you do not have a valid user name and password.

WINDOWS® PLATFORM

Before physically installing the board it is recommended Khomp recommends installing the software package, which contain the device drivers for the board. If the board is installed prior the software, the operating system will ask for the device driver, that is not installed yet.

During the installation of the current version of the K3L installer, the Installation software will guide you through the steps. Click the "Next" button to go to proceed through all the steps.

After the software installation, the computer must be Shut down. Physically install the the Khomp board as any normal PCI board installation. Restart the computer. When restarted, the operating system will detect the new device and the *Windows's®, New hardware assistant* will ask you for the device driver. The files required will be available in *Z:\KhompX.Y\Driver*, where "Z" is the installation drive and "X" and "Y" refer the K3L version installed.

In case of installing the board before the software, the files will not be available yet. So you can cancel the assistant, install the software, and install the driver manually through the *Device Manager*.

Once the board and the drivers are installed, you should configure the board, through the KConfig application and start the Khomp System Watcher service, that is responsible for boot the boards.

Ever time you change the setting, you MUST restart the Khomp System Watcher for the settings to take effect.

1. Configuration tool:

Start->Programs->KHOMP->Khomp KConfig

2. If the *call progress* configuration is needed:

Start->Programs->KHOMP->Khomp KCPCConfig

3. To start the system:

Control Panel->Administrative Tools->

Services->Khomp System Watcher. <start>

For more information about the software or the boards, consult the documents in *Z:\KhompX.Y\docs*

LINUX PLATFORM

Physically install the Khomp board in the server. Download the proper package for your Linux distribution. After downloading the current K3L package, the package should be installed with the following commands:

1. Unzip the package:
gunzip [package name].sh.gz
2. Run installation script:
bash [package name].sh

Now you can load the kernel module, configure the boards and start the process server.

1. To load the kernel module:
kpload
2. Configure the boards:
k3lconfig
k3lsystemconfig
3. If the *call progress* configuration is needed:
k3lcpwizard
4. Start the process server:
kserver start

The boards are successfully installed and you can run your application.

For more information about the software or the boards, consult the documents in */usr/doc/khomp*.

INSTALLATION OF ANTENNA MODULES

STEP 1: INSERT SIM CARD

To start working, the GSM modules must have a SIM card inserted. Figure 3 shows a GSM module and location to insert GSM SIM card.

The module is connected to the board by screws; it is recommended that the card is inserted into the SIM slot without removing the board, as illustrated in Figure 4.

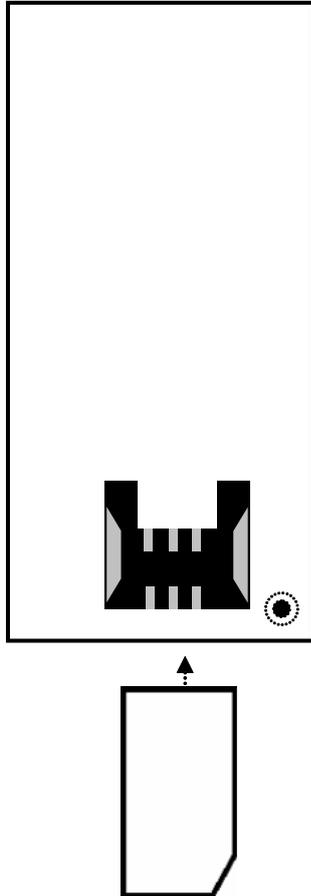


Figure 3 GSM Module

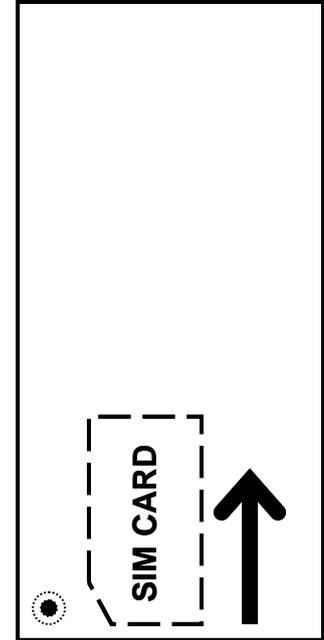


Figure 4: view of GSM module when connected to the board

STEP 1: CONNECTING A MODULE

This step is only necessary when expanding the system, through the addition of more GSM modules to the base board. When purchased together, module and base are distributed already assembled.

When sold separately, the GSM module can be screwed to the first available slot of the board, in numeric order, from least to greatest. The numbers are visible by the marks "MODULO X" in the Figure 1, where X represents the number of the slot for box.

The cable that enables the antenna to be connected to the module comes connected, but still needs to be mounted to the metal board, for future connection of the antenna.

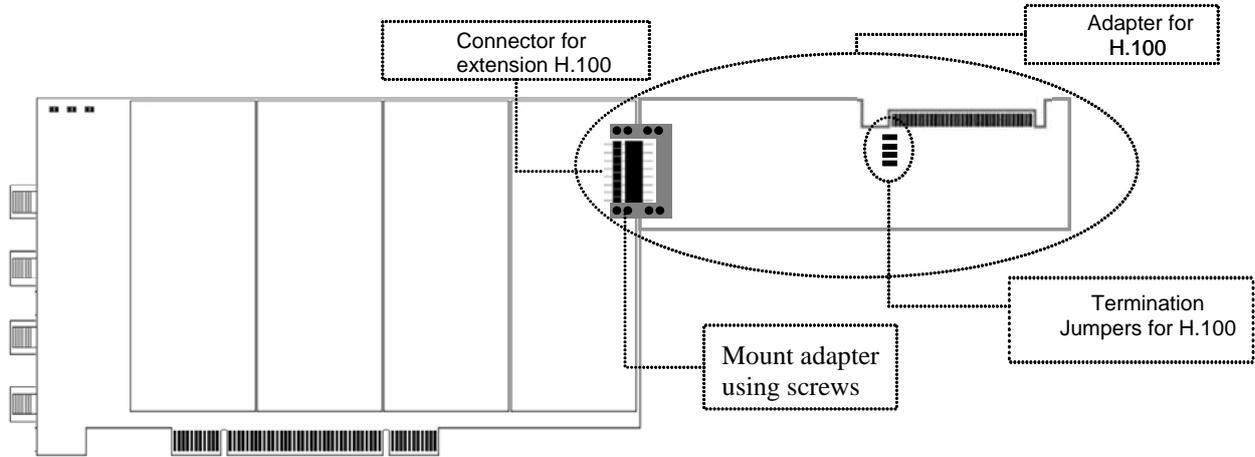
STEP 2: CONNECTION OF ANTENNA

For each GSM module, Khomp provides an antenna that could be attached, through the face of the base, of the metallic base. For the best capture of the signal it is advised that the antennas are placed in a vertical position, and that they are adjusted until the signal capture is the maximum.

INSTALLATION OF H.100 BUS

H.100 is a bus specifically permitting communication directly between telecom boards also known as a CTBbus. The boards communicate thru a cable connected to the H100 slot on the back of the board, shown in the below image as Adaptor for H.100.

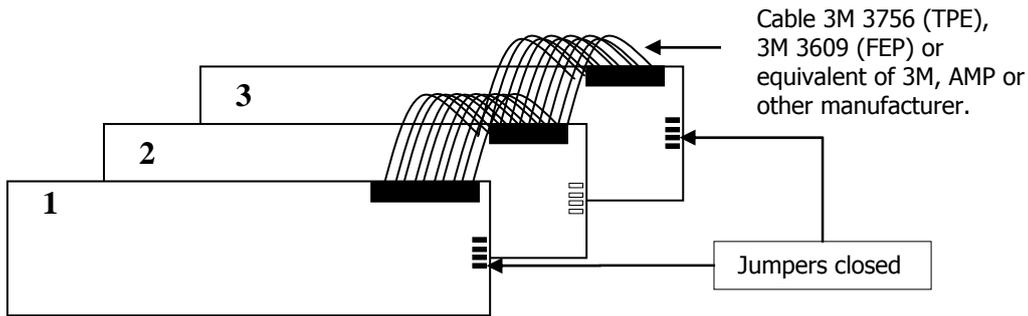
The adaptor is sold separately from the KGSM-40, and can be connected to the base of the board in the location indicated below, in the location indicated as "Connector for adapter H.100", in the Figure below.



Adapter for H.100

STEP 1: CONNECTION

It is recommended that the cable has the same number of connectors as boards. In the case that the cable has more connectors than necessary, the connectors at the ends of the cable must be connected leaving any unused connectors in the middle.



Connection scheme for H.100

STEP 2: JUMPERS

The board that is at the end of the H100 connector has four jumpers: J1, J2, J3, and J4. These jumpers terminate each connection of the board, such that, jumpers of the boards connected at the end of the H.100 cable must be closed and any and all boards in between must be open.

STEP 3: CONFIGURATION

The GSM board disregards configurations of the H.100, if it doesn't receive a valid network reference, it can't be master of the bus, and acts as a slave if connected.

VOIP SETTINGS

The installations provide a standard configuration that should work in most cases, but in some system may be necessary to change some values. These values can be configured in the KConfig application, on Windows® systems, or in the k3lconfig application, on Linux environments.

RTP port range: Range of ports used by Khomp board's RTP stack. These ports are arranged dynamically during the call establishment, and may conflict with ports used by other applications. Change these values to avoid these conflicts. The standard values are 10000 to 12000.

Gateway port: standard SIP port is 5060, but if for some reason, you need to run other SIP stack in the same system that the boards are installed, you can change the value of the port used by Khomp's SIP stack.

Audio package size: it should be adjusted to the size of packages used by the other VoIP equipments in the network, like SIP phones, soft-phones or ATAs. Common values are 24 or 30 milliseconds.

Standard proxy: address of the proxy server routing the calls on the network.

IP interface: in case of a system with more than one IP address, it is necessary to set the interface that should be used by Khomp's SIP stack.

CODEC priority: the CODEC selection is made dynamically during the call. You can configure which of the available CODECs are selectable and their selection priority

LEDS

FRONTAL LEDS

| <i>State</i> <i>LED</i> | On | Off | Blinking |
|----------------------------|-----------------------------------|-----------------------------------|-------------------------------------|
| LD7 | Switch malfunction | Switch malfunction | Switch working right |
| LD3 | No communication with host system | No communication with host system | Communication with host established |
| LD2 | DSP error | DSP error | DSP active |

BACK LEDS

The LEDs located in the back part of the board, shows the state of the channels associated to the modules. In the table below, letter X refers to the LED number, letter Y refers to the channel number and letter Z refers to the number of the channel's module.

The LEDs are spread in the following order: LD1-channel 0-module 1, LD4-channel 1-module 2, LD5-channel 2-module 3 e LD6-channel 3-module 4.

| <i>State</i> <i>LED</i> | On | Off | Blinking |
|---------------------------------------|---|---|------------------|
| LDX channel Y module Z | Module GSM is working and the state is idle | Module GSM is working and the state is in call or data transmitting | Module GSM error |

It is important notice that when the board is turned on, 3 LEDS will be on and 1 LED will be off.

TECHNICAL FACTS

- Capacity: up to four GSM quad band modules.
- Networks GSM: EGSM: 900/1800 MHz e GSM: 850/1900 MHz
- Transmission power: 2 W, 850/900 MHz, 1 W, 1800/1900 MHz (per module)
- Voice CODECs : EFR/HR/FR/AMR
- Antenna interface specifications :

| Parameter | Condition | Specification |
|-----------|-----------|-----------------|
| GSM 850 | TX | 824 - 849 MHz |
| | RX | 869 - 893 MHz |
| GSM 900 | TX | 880 - 915 MHz |
| | RX | 925 - 960 MHz |
| DCS 1800 | TX | 1710 - 1785 MHz |
| | RX | 1805 - 1880 MHz |
| PCS 1900 | TX | 1850 - 1910 MHz |
| | RX | 1930 - 1990 MHz |
| Impedance | | 50 Ω |
| Interface | | SMA |

- SIM Card:
 - Standard ISO/IEC 7816
 - Size: 25 x 15 mm
 - Capacity of 32, 64 or 128KB
- Cable H.100: 3M 3756 (TPE), 3M 3609 (FEP) or equivalent 3M, AMP or other manufacturer
- Connector PCI compatible with bus PCI V2.2 universal (3V3 e 5V)

MORE INFORMATION

Additional information about the boards and operational configuration of the software can be obtained:

- The documentation available in the installation packages are in the directories:

Windows@: Z:\khompX.Y\Driver, where X and Y refer to the version of K3L installed, and Z refers to the drive or package that was installed

Linux: /usr/doc/khomp/

- The site of Khomp:
<http://www.khomp.com.br/produtos>

- Or through user support:

<http://www.khomp.com.br/suporte> or by telephone (48) 3233-2933

| |
|-----------------------------|
| SOLUTION OF PROBLEMS |
|-----------------------------|

- ***Where can I acquire a login and password to download the API.?***

A login and password are sent by support of Khomp after the purchase of a board is confirmed by commercial.

- ***Module of Kernel is not encountered***

Khomp provides drivers/modules limited by distribution. On the site www.khomp.com.br there is a list of distributions supported. In the case your distribution is not supported, an installation can fail with the message "Driver para o kernel {SEU_KERNEL} não encontrado". Khomp recommends using in this case supported distributions if possible, contact technical support with any questions.

- ***What is and when must I configure call progress?***

Call progress is the name of the resource that permits control of the call (busy, answered, hang-up, etc.) through the tones of the line and detection of silence or voice. It is necessary to configure the call progress in a case where the system has analog boards or protocols E1 that depend on this resource (*E1LineSide* e *CAS_EL7*).

- ***Weak Signal.***

The antennas should be positioned vertically, and can be adjusted manually to the best signal quality. The server can be in a location of a weak signal, if necessary it should be moved to a better place with better signal reception.

- ***Some channels are indicating failure.***

Only channels that possess an encased GSM module are operable.

- ***A channel of a module is starting to fail.***

The modems are in a free state when operating perfectly. Because of this it is necessary that a module is duly incased, the cable is connected to the metal plate, and an antenna is connected to the cable. Other than this, a valid SIM card must be inserted.

- ***KServer did not start and shows a message "Erro ao iniciar biblioteca SIP".***

One of the causes most common for this error is that the other software is using the SIP port, which was configured for use by Khomp. In this case, verify the IP Port is open, and modify the used port of the application, or the Khomp software.

- ***The audio that passes by VoIP is with bad quality.***

Verify the size of the package of audio used by SIP phones, soft phones, or ATAs that are integrated with the boards (normally 20 or 30ms), and adjust the size of the packet that the software or the applications of configuration of Khomp are equal. Verify the traffic of the network to guarantee that it doesn't have overload.