



KKO USER'S MANUAL

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INTRODUCTION

KKO is versatile card intended to cooperation with MD-110 Consono and Business Phone exchanges manufactured by Ericsson. KKO card is inserted to the exchange magazine, from where draws power supply (+5V & -5V only for MD110 and +5V & -12V for BP only).

KKO is designed for carryout large voice conference up to 60 participants via two PCM30 routes with Channel Associated Signaling (CAS according to ITU-T Q.441). Sophisticated algorithms makes possible to rich high voice quality and control flexibility.

Additionally the KKO has flash memory device for recording user-defined messages (announcements), which may be played in some contexts or in conference (broadcasting).

Further, the KKO includes DTMF receivers block, which enables some control functions.

kClient software, which is enclosed to each the KKO card, gives the user access to all functional options.

HOW IT WORKS?

The subscriber may participate in conference in following ways:

- ✓ **Active** or **Duplex** (subscriber listens to and is listened),
- ✓ **Passive** or **Simplex** (subscriber listens to only).

The participants may be included in conference in following modes:

- ✓ **Automatic** switching over,
- ✓ Always **passive**.

Automatic switching over mode is realized according to following principles:

- ✓ Participant entries in active mode at the moment when starts to speak; this operation is imperceptible for the subscriber,
- ✓ Then, if subscriber stops to speak, passes onto passive mode after some time,
- ✓ During conference, switching algorithm checks the participants and time conditions and takes decisions,
- ✓ Participants included in **always active** mode are never switched to passive mode,
- ✓ Participants included in **always passive** mode are never listened by others regardless of their voice level.

The dispatcher may include the participants in conference by threefold method:

- ✓ As a single subscriber,
- ✓ As a member of the conference group,
- ✓ As a database component.

Further, subscribers can include in conference single-handed if this option is enabled.

The KKO identifies subscribers on the basis of their phone numbers and aliases. Phone number may consist of up to 21 digits and/or “*” / “#” / “,” / “w”(pause) characters.

Alias is optional, maximum 21-character string, which identifies the subscriber.

Note, that single-handed included subscribers have no phone number but route and PCM channel numbers (CAS makes impossible phone presentation).

PRINCIPLES OF SUBSCRIBERS CALLING

Subscribers are called by the KKO according to following principles:

- ✓ The subscriber is called using pulse or tone dialing in CAS,
- ✓ The subscriber may be called individually or together with group or database,
- ✓ KKO makes possible to program up to 600 phone numbers,
- ✓ If the subscriber is already taken on to the conference (if it has been called to the conference by the KKO), calling will be ignored,
- ✓ KKO does not know phone numbers of the subscribers which have been taken on to the conference by single-handed, and theirs calling will be done,
- ✓ If called subscriber is busy, KKO will call it again after timeout,
- ✓ If called subscriber does not answer, ringing is kept for declared time, after which calling is stopped (standard 3 minutes),
- ✓ If conference will be closed before this time, KKO will break calling.

HARDWARE CONCEPTION

The KKO consist of following modules:

- ✓ Main unit,
- ✓ Dual PCM30 interface,
- ✓ Switch & Conference unit,
- ✓ Quad DTMF receiver,
- ✓ Dual VOX processor,
- ✓ FLASH interface.

Each module of the KKO became talked over in after-mentioned document.

MAIN UNIT

This module contains indispensable components for activities all features of firmware:

- ✓ Processor and memories,
- ✓ System bus,
- ✓ Clock system.

Main unit is based on Dallas DS80C320 microprocessor. The firmware is responsible for communication with user and all other modules. If the watchdog indicator LWDT placed on the front panel (see Appendixes 3,4) is blinking, the firmware works properly.

Non-volatile memory placed on the KKO includes event's buffer and alarm's buffer. Event's buffer keeps traffic events, for example conference start/stop, subscriber insert or settings change.

Alarm's buffer keeps abnormal situations, for example loss of synchronization or real time clock error. Each alarm and event record has own time-stamp.

Note: Fast blinking of the LWDT informs that new alarm occurs.

The KKO in hardware version 2 co-operates with kClient application via opto-isolated RS-232 interface using primary interface cable (for details see Appendix 3) delivered by the manufacturer.

The KKO in hardware version 3 co-operates with kClient application by LAN card in point-to-point configuration or via hub or switch. In appendix 4 is shown cable connections in both workmanships.

Clock system generates all clocks needed by peripherals. Clocks synchronization is based on Zarlink MT9042 chip and works according to following principles:

- ✓ The KKO extracts 2MHz clock from PCM30 routes E1A & E1B,
- ✓ Arbitration unit selects valid clock and adjusts all other clock signals to it,
- ✓ If synchronization is lost, clocks are formed as freerun.

CONFIGURATION & SETTINGS

After installing the KKO in exchange magazine and when fatal error occurred, user should press RESET button (see Appendix 3 add 4). After this all LEDs on the front panel blinks for several seconds.

If cold reset jumper (JMP1) is shorted, cold restart occurs and all settings are set to default values (announcements are not erased).

DUAL PCM30 INTERFACE

This is the basic module of the KKO, which makes possible to link it with proper PCM30 device in the exchange. Module has two independent interfaces named E1A & E1B respectively.

Module co-operates with the exchange across PCM30 link with CAS signaling using one or two PCM30 interface card (TLU76 or later). From MD-110 or BP point of view the KKO is seen as additional external automatic exchange.

By default the KKO consists of one PCM30 interface (E1A).

This module is based on Zarlink MT9075 interface circuit and meets the ITU-T Recommendations including G.703, G.704, G.706, G.732, G.775, G.796, and G.823 for PCM30 and I.431 for ISDN primary rate.

SIGNALING

Each interface has synchronization LED (yellow). LED shines when:

Basic frame synchronization is achieved, and

- ✓ Multi-frame synchronization is achieved, and
- ✓ CRC-4 synchronization is achieved (if enabled), and
- ✓ Full synchronization is stable for 2 seconds.

CONFIGURATION & SETTINGS

Module is connected with MD-110 and BP using 120Ω twisted pair cable (see Appendixes 1 and 2).

In order to ensure correct co-operate with KKO, in MD-110 Consono need to be done following settings:

- ✓ Set CAS signaling scheme 69 (CCITT MFC Digit transmission),
- ✓ Set TLU76 as master,
- ✓ Set receiving digits as pulse or tone (the same as on the KKO),
- ✓ Enable CRC-4.

All settings details for connecting KKO and Business Phone exchange are explained in '*enBPconfiguration.pdf*' file.

SWITCH & CONFERENCE UNIT

This module is responsible for PCM channels distribution. It links PCM30 interface with other modules required access to PCM samples and sends essential data messages for control.

Switching is based on Zarlink MT8985 Enhanced Digital Switch and MT90812 Integrated Digital Switch with conference.

SIGNALING

Conferences presence is signaled by two green LEDs on the front panel (see Appendixes 3,4).

If conference is active and at least one participant speaks then respectively conference LED shines. If all participant are in passive mode LED is blinking.

QUAD DTMF RECEIVER

This module consists of four pairs: PCM filter codec (Zarlink MT8965) - DTMF receiver (Zarlink MT8870). Signal from PCM30 channels is switched onto codec and after d/a conversion is sent to receiver.

DTMF receivers get some utility functions:

- ✓ Conference number choice for single-handed subscribers,
- ✓ Other special functions (on request of user), for example:
 - x receipt acknowledge,
 - x password features,
 - x menu system with voice prompt,
 - x users presentation.

SIGNALING

Each DTMF receiver has own LED (green), which signals valid detected tone.

DUAL VOX PROCESSOR

This module consists of two independent units based on Microchip PIC18C252 microprocessor. Each unit processor checks voice levels of the conference participants and informs main unit about them. This allows detecting start and stop of participant speech and switchover it between passive and active modes.

SIGNALING

Each VOX unit has signal LED (yellow), which changes state after message receiving.

FLASH INTERFACE

This module realizes three basic functions:

- ✓ Announcements recording,
- ✓ Playing announcements in defined contexts,
- ✓ Playing announcement in conference.

SIGNALING

Work modes are signaled by the LEDs blinking in following ways:

- ✓ Fast on erasing,
- ✓ Medium on programming,
- ✓ Slow on playing.

CONFIGURATION & SETTINGS

It is possible to record up to 15 announcements in two versions:

- ✓ for 30 channels up to 4 minutes and 22 seconds accessible for recording,
- ✓ for 60 channels up to 8 minutes and 44 seconds accessible for recording.

kClient software makes possible to read actual announcements state and play/erase/record them. Also, user can define contexts for playing them, eq. conference welcome, conference goodbye etc. or insert them to the conference as a participant for broadcasting.

COMMUNICATION MODULE XPORT(TM)

The KKO cards in hardware version 3 is equipped with the Communication Module Xport(TM) by Lantronix. This is special module makes possible cooperation with the KKO directly by Ethernet without kServer software. The Xport is media and protocols converter and it works with internal serial interface on the KKO board.

For proper working of the KKO conference system, you have to meet following requirements:

- ✓ It is necessary to insert into kClient software the same port number set in the Xport device,
- ✓ It is necessary to insert into kClient software the same IP address set in the Xport device,
- ✓ It is necessary to insert into the Xport proper IP mask,
- ✓ You have to set proper serial port parameters i.e: baudrate = 9600, connection mode = C0 and I.F Mode parameter = 4C.

DETECTION OF AN ADDRESS AND PORT NUMBER FOR THE XPORT

For new KKO card, firstly, you have to configure the Xport device. In order to achieve this purpose, you are able to use one of following methods:

- Run **autodetection** of an address from **kClient** software level („Settings->Communication->Search IP port”). After execution of this procedure, all accessible parameters will be displayed in the window and the most important : IP address and Port Number will be written in main window as a communication parameters. This is a recommended method.
- To use tool software **DeviceInstaller** by Lantronix(TM) accessible in their web sides. This is special software dedicated for the Xport searching/assigning/configuring. Unfortunately in order to use it, you must download it, install the software and additional components.

After autodetection procedure, it is recommended to set permanent IP address of the device. In the other case, it is probably you have to search an address everytime after resetting the module. If the permanent address won't be accessed, it will be set by DHCP server or (if it is missing) automatically from autoaddress range.

Accessing of an address you can realize by following ways:

- from kClient level (“Settings->Communication->Search IP port”) you can change an address and subnet mask and next use “Save Xport” button in order to save data in Xport nonvolatile memory,
- by DeviceInstaller software using IP assigning options,
- by telnet and special configuration port no 9999.

In such a situation (alike previous case) recommended way is the easiest i.e. via kClient software.

SECURITY OF ACCESS FOR THE XPORT

After IP assigning, it is recommended to switch on some security options in Xport device in order to makes it impossible to reconfigure it by unathorized users. In order to do it, it possible to use the telnet and change following options:

- Chapter „**6-Security**” - hard limitations
 - „**Disable telnet setup (Y)**” - in order to quite switch off telnet setup possibility
 - „**Disable web server (Y)**” - in order to switch off web server setup possibility
- Chapter „**0-Server**” - light limitations
 - „**Change telnet config password (Y)**” - in order to using a password for configuring by the telnet

- Additionally using a browser you are able to switch on access with a password for web configuration (it is valid option if „Disable web server” option is set on 'N').

Access to the Xport is possible by following command:

telnet nnn.nnn.nnn.nnn 9999

where: nnn.nnn.nnn.nnn is IP address of our KKO card.

Next, within 3 seconds time, you have to press ENTER key in order to enter into main menu of the Xport. More details you can find out on Xport manufacturer - Lantronix company web sites (www.lantronix.com).

In case of using light security (access passwords only) it is possible to reconfigure the Xport in the future easy.

In case of hard security (access is disabled) it is impossible to reconfigure it simply. In such situation another method will be required. This method is implemented in KKO firmware and it makes possible to access “from inside” using internal serial interface.

XPORT ACCESS VIA INTERNAL SERIAL PORT

Beginning on X.16 firmware version, it is possible to access automatically in the Xport via internal serial port. By this way it is possible to recover full access using “Factory defaults” option. Next, after unblocking all important limitations, you are able to use telnet access and change all important options.

Access “from inside” is unlimited, it is possible always independently on any securities.

Especially it is **possible even** in such situations:

- telnet and web access are disabled,
- if the passwords are required - in this case they are resetted,
- if serial port parameters are unproper (e.g. baudrate is not equal 9600)

Following description shows how to use this procedure.

FACTORY DEFAULTS RETRIVE PROCEDURE FOR THE XPORT

In order to reset the Xport device (factory defaults), you have to run following steps:

1. Be sure that you have installed in your KKO card firmware in X.16 version or later.
2. Plug off network interface cable and PCM interface trunk cables.
3. Pull out the KKO card from exchange's magazine.
4. Close both jumpers : JP1 and JP2 on the board.
5. Insert the card into magazine.
6. Press "Reset" button (located on the edge of the card).
7. Observe LED diodes on the edge of the pcb.
8. After about 1 second upper green diode should be lighted.
9. After next about 1 second bottom green diode should be lighted.
10. After next about 1 second red diode should be lighted.
11. If all three LEDs are lighted, it means that the procedure is executed correctly.
12. Pull out the card from a magazine.
13. Remove jumpers: JP1 and JP2.
14. Insert the card into magazine once again.
15. Press "Reset" button.
16. Plug in network interface cable (Xport).
17. Connect with the Xport via telnet, verify all settings and insert your changes (if necessary).

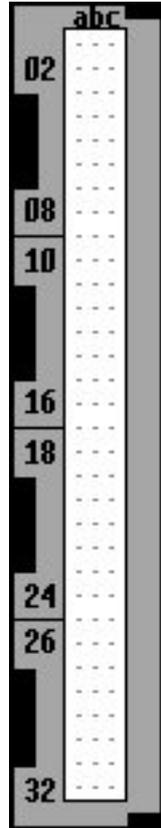
All important settings required for proper cooperation between (the KKO card) <-> (kClient software) are as follow:

- 0-Server
 - **IP address** - depending on given subnet (factory default procedure doesn't change IP address and subnet mask)
 - **IP mask** - depends on subnet conditions
- 1-Channel1
 - **Baudrate** : (9600)
 - **I/F Mode** : (4C)
 - **Flow** : (00)
 - **Port no** (1962-for kClient software up to X.15 including)
 - **Port no** (default 10001 - beginning on X.16 version the port number is any but the same both in Xport and kClient software. Default value is 10001)

The rest, nonmentioned parameters aren't matter.

APPENDIXES

APPENDIX 1. THE KKO CONNECTIONS FOR MD110

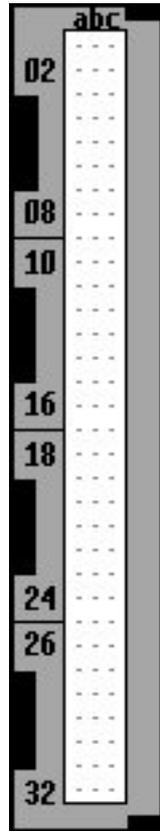


TLU76 bottom connector

TLU76 front panel bottom connector	<i>KKO 8-pin RJ</i> 
TLU76 TxSignal 26a/b/c pins	RxA pin 5
TLU76 TxGround 28a/b/c pins	RxB pin 4
TLU76 RxSignal 30a/b/c pins	TxA pin 3
TLU76 RxGround 32a/b/c pins	TxB pin 6

PCM30 link cable

APPENDIX 2. THE KKO CONNECTIONS FOR BUSINESS PHONE



TLU76 bottom connector

TLU76 front panel bottom connector	<i>KKO 8-pin RJ</i> 
TLU76 TxSignal 26a/b/c pins	RxA pin 5
TLU76 TxGround 28a/b/c pins	RxB pin 4
TLU76 RxSignal 30a/b/c pins	TxA pin 3
TLU76 RxGround 32a/b/c pins	TxB pin 6

PCM30 link cable

APPENDIX 3. THE KKO FRONT PANEL. HARDWARE VERSION 2



LCF1- Conference No. 1 LED

LCF2- Conference No. 2 LED



LWDT- Watchdog LED



B1- Reset button

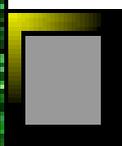


KKO male DB-9 pin	Signal description	PC female DB-9 pin
2	RxD	2
3	TxD	3
5	GND	5
7	PWR	7

RS-232 "primary" cable



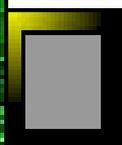
LE1B- E1 route synchronization LED



JE1B- E1 route connector



LE1A- E1 route synchronization LED



JE1A- E1 route connector

APPENDIX 4. THE KKO FRONT PANEL. HARDWARE VERSION 3



LCF1- Conference No. 1 LED

LCF1- Conference No. 2 LED

LWDT- Watchdog LED

B1- RESET button

Network cable for KKO

<i>KKO - module Lantronix</i> 	<i>Workmanship point-to-point</i> 	<i>Workmanship for hub or switch</i> 
TX+ pin 1	RX+ pin 3	TX+ pin 1
TX- pin 2	RX- pin 6	TX- pin 2
RX+ pin 3	TX+ pin 1	RX+ pin 3
DC+ pin 4	DD+ pin 7	DC+ pin 4
DC- pin 5	DD- pin 8	DC- pin 5
RX- pin 6	TX- pin 2	RX- pin 6
DD+ pin 7	DC+ pin 4	DD+ pin 7
DD- pin 8	DC- pin 5	DD- pin 8

LE1B- E1 route synchronization LED

JE1B- E1 route connector

LE1A- E1 route synchronization LED

JE1A- E1 route connector

APPENDIX 5. THE CONFERENCE MENU

Conference menu makes possible to carry on conferences and call single subscribers or predefined groups to them by means of phone. Of course, the phone needs to send DTMF signals.

Menu is configured via the kClient application. There are some options and contexts in Settings/Menu window. Supervisor or conference admin can record requested announcements and associate it in fixed context.

Subscriber or dispatcher needs call the KKO PCM30 route to enter to the conference menu. Next, password is required (if enabled). If the password is correct, user is authorized.

Conference menu realizes 8 functions, divided between three groups:

- ✓ subscribers/groups entry to any working conference (1, 2, 3 codes),
- ✓ subscribers/groups entry to reserved conference (4, 5, 6 codes),
- ✓ reservation and dismissal of conference (7 and 8 codes),
- ✓ entering the subscriber into private talking (code 9),
- ✓ entering into voice help announcement (code 0).

The difference between commands 1,2,3 and 4,5,6 is a result of different treating of the conference from the KKO viewpoint. Conference reserved via phone from the conference menu is inaccessible for kClient dispatchers. The dispatcher can not take it and does not view it. Only supervisor and admin have this right.

Detailed description of the conference menu is included in „Menu description” document (*enKKOMenuVer2.pdf* file).