# SETEL-D

# System Description



Selective Party Line Telephone Set
with integrated Decoder

**BlueCom Ltd.**

| Doc.-No. | Revisison | Date |
|---|---|---|
| BCTS1047 | Rev. 0 Master Edition | 3.9.2013 |
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Great care has been taken to ensure that the information contained in this handbook is accurate and complete. Should any errors or omissions be discovered or should any user wish to make a suggestion for improving this handbook, he is invited to send the relevant details to:

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# 1 Introduction

The selective party line telephone set with integrated decoder SETEL-D is used in classical party line networks and as a service telephone in digital SDH/PDH communication networks. The SETEL-D is compatible with the former SETEL and existing ABB party line telephone systems.

SETEL-D combines the functions of a 4-wire telephone set and a DTMF decoder. When used together with the 4-way bridging amplifier (J3KA), a complete party line telephone system can be constructed.

The programmed data is stored in an internal SD Memory card inside the SETEL-D. All functions can be programmed with the aid of the dialling key pad and the built-in 20 character by 2 line LC-Display.

The SETEL-D has three main operational modes:

**Mode 1:**      **Standard 4W party line telephone set with DTMF decoder**

**Mode 2:**      **Connection to a 4W E&M PABX (not yet implemented)**

**Mode 3:**      **4W-telephone set without DTMF decoder (MUTEL Mode)**

# 2   Mode of Operation

The SETEL-D can be programmed for three different operating modes.

Mode 1:        4W Party Line Telephone Set with DTMF Decoder
Mode 2:        Connection to PABX
Mode 3:        4W Remote Subscriber (MUTEL mode)

## 2.1   Mode 1, Standard Party Line
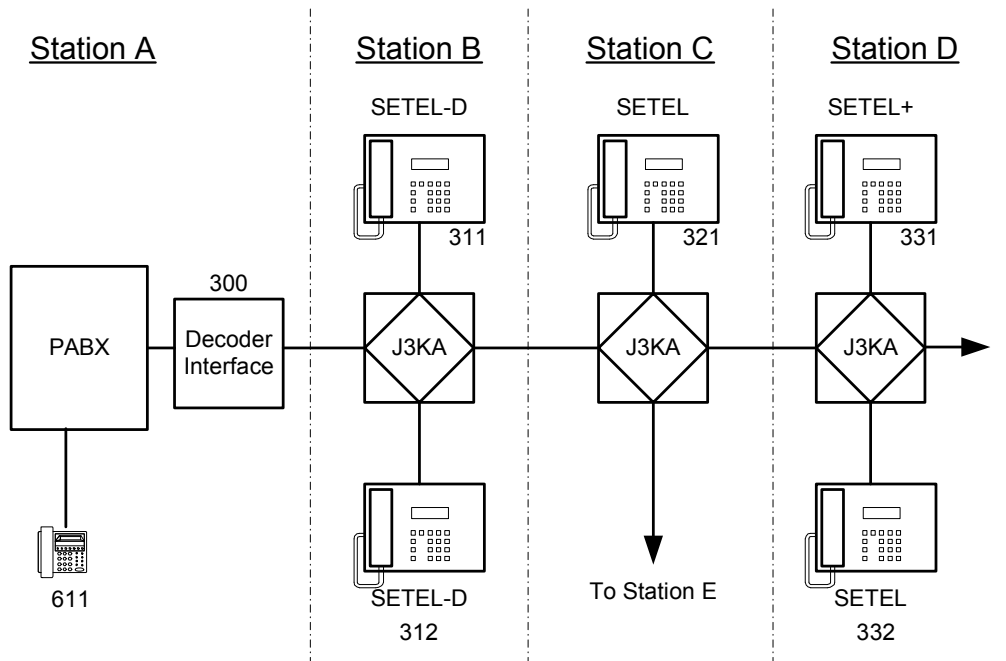


In this application all SETEL-D telephone sets are sharing one analog 4W-voice channel. All
SETEL-D telephone sets have to share this voice channel and only one call can be made at
the same time. If two SETEL-D sets are communicating with each other and a third party
lifting the handset is automatically connected to the call and the new party can take part in the
conversation. (listen and talk).
E&M signals are not required for this application.
The SETEL-D is compatible with all ABB Party Line systems and old versions of SETEL.

## 2.2   Mode 2, Connection to a PABX

In this mode the SETEL is acting like a PABX with one 4W E&M Interface. It can be connected to any PABX, who is supporting continuos signalling protocol on the E&M Interface.
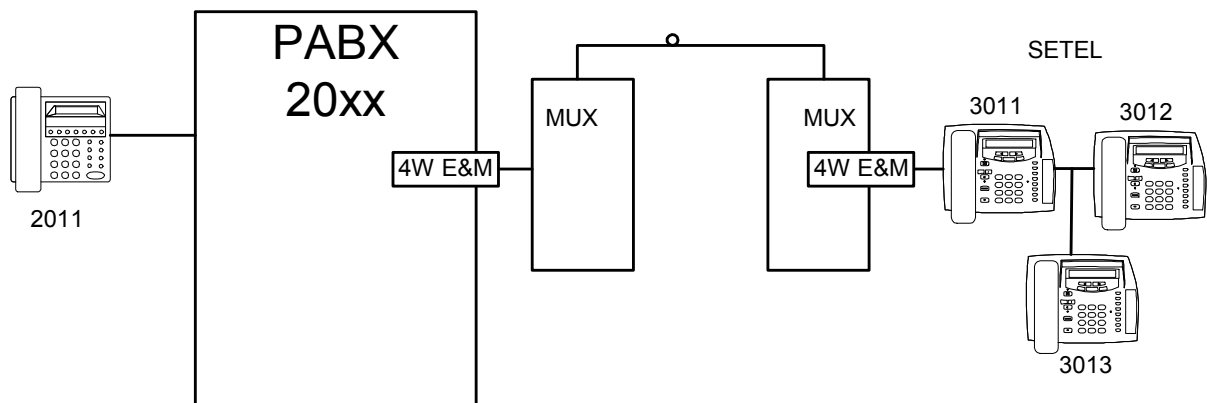


In this mode E&M signals have to be used in SETEL 3011. The call progress tones are provided by the SETEL-D.
Digits received with pulse dialling will be converted to DTMF tones and will be resend.

## 2.3   Mode 3, 4W Remote Subscriber (MUTEL)
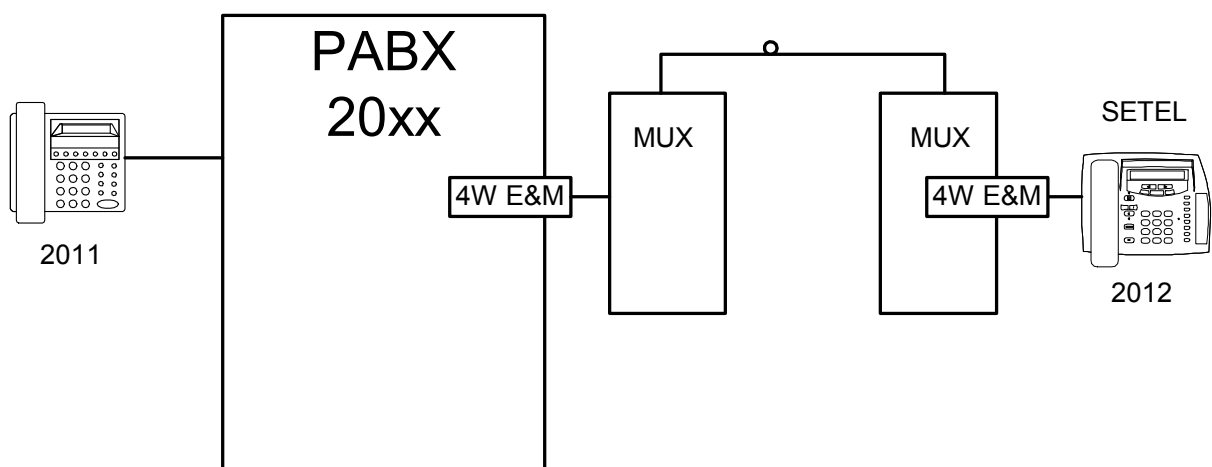


In the SETEL 2012 the E&M signals have to be used. An incoming call is signalled by activating the E signal on the 4W E&M Interface in the PABX. In this mode the DTMF decoder inside the SETEL is not used. An outgoing call from the SETEL 2012 is signalled by activating the M signal on the SETEL 2012. After that call progress tones will be provided by the PABX.

## 3 SETEL-D Layout and Keys



Function Keys

To program speed dial numbers and special functions

Hands Free

**Loudspeaker Key** Switch On and Off the hands free mode

**Plus/Minus Keys**
Volume adjustments of ring, voice on the loudspeaker and voice in the handset

**Backward Key**
to move backward in the input menus

**Forward Key**
to move forward in the input menus

**ESC Key**

F Key 12

To escape from the menus without saving.

**ENTER Key**

To confirm and save inputs in the input menus

**Clear-Key**

F Key 11

To clear or delete values in the input menus

**Further Keys**

**Redial Key**

To redial last number dialed

**Hook Switch and Telephone Directory**

This key is also used to change between numbers, small and capitol letters for the text entries.

When entering text the following letters will be displayed depending on the number of times a key has been pressed. The  key is used to switch between small and capitol letters.

|   | 1x | 2x | 3x | 4x | 5x | 6x | 7x | 8x | 9x | 10x | 11x | 12x |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Space | 1 | € | £ | $ | ¥ | ¤ | | | | | |
| **2** | a/A | b/B | c/C | 2 | ä/Ä | | | | | | | |
| **3** | d/D | e/E | f/F | 3 | | | | | | | | |
| **4** | g/G | h/H | i/I | 4 | | | | | | | | |
| **5** | j/J | k/K | l/L | 5 | | | | | | | | |
| **6** | m/M | n/N | o/O | 6 | ö/Ö | | | | | | | |
| **7** | p/P | q/Q | r/R | s/S | 7 | | | | | | | |
| **8** | t/T | u/U | v/V | 8 | ü/Ü | | | | | | | |
| **9** | w/W | x/X | y/Y | z/Z | | | | | | | | |
| **0** | . | , | ? | ! | 0 | + | - | : | ; | _ | | |
| **\*** | | | | | | | | | | | | |
| **#** | # | * | & | ( | ) | @ | \ | / | < | = | > | % |

# 4 Hardware Block Diagram
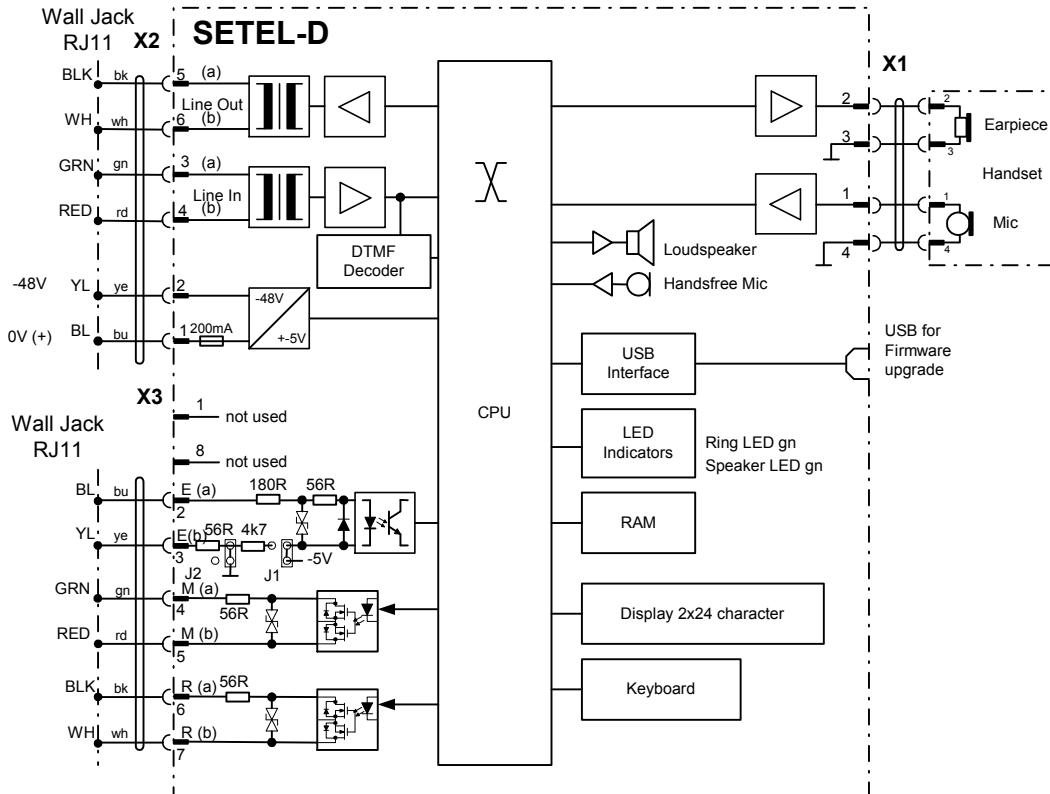
# 5   Programming of SETEL-D

To enter the programming mode of the SETEL-D you have to press the Enter Key
Then the first menu item will be shown on the display!
>    Parameter:
>    Change?

With backward, forward, Enter and F key 11 and F key 12 you can move inside the menus.

When the SETEL-D is in programming mode the Yellow LED on function key 11 and 12 are blinking.

The default PIN Code is: **0000**
Below you will find the explanations and structure of the full SETEL-D menu

## 5.1 Menu Structure

Programming Menu
Tree

**Parameter: change?**

| Menu Item | Description |
|---|---|
| PIN? | Default PIN: 0000 |
| Call Number A? | 1 to 6 Digit Call number A; Default: 00 |
| Call Rhythm A? | Rythm 1: 1s on/4s off; Rythm 2: 0.5s on/ 0.5s off, 0.5s on, 3.5s off<br>Rythm 3: continous; Default: Rhythm 1 |
| Group Number B? | 1 to 6 Digit Group Call Number B; Default: No Group Number |
| Call Rhythm B? | Rythm 1: 1s on/4s off; Rythm 2: 0.5s on/ 0.5s off, 0.5s on, 3.5s off<br>Rythm 3: continous, Default: Rhythm 2 |
| Group Number C? | 1 to 6 Digit Group Call Number C; Default: No Group Number |
| Call Rhythm C? | Rythm 1: 1s on/4s off; Rythm 2: 0.5s on/ 0.5s off, 0.5s on, 3.5s off<br>Rythm 3: continous, Default: Rhytm 3 |
| Idigit Guard -t? | Values 1 to 99s, Default: 5s |
| Ring Time? | Values 1 to 99s, Default: 30s |
| DTMF Burst Time? | Values 50, 100, 200, 400ms; Default: 50ms |
| Name? | Enter the SETEL Name. This info will be shown on the display when idle<br>Default: BlueCom SETEL-D |
| Contrast? | Change Contrast of the display<br>Default Value: 10 |
| Start Boot Loader? | Restart of SETEL-D |

**Settings: change?**

| Menu Item | Description |
|---|---|
| Volume Ring? | Volume of Ring, 0-100%<br>Default: 50% |
| Volume Speaker? | Volume of Speaker, 0-100%<br>Default: 50% |
| Volume Handset? | Volume of Handset speaker, 0-100%<br>Default: 50% |

**Hardware: check?**

| Menu Item | Description |
|---|---|
| Display? | Display and LED Test |
| Keys? | Keyboard and Hook Switch Test |
| DTMF / Ring? | DTMF and Ring Test |
| Audio? | Audio Level Test |
| All? | All Tests as above |

**Info: show?**

| Menu Item | Description |
|---|---|
| Hardware Revision: | Display of Hardware Revision |
| Software Revision: | Display of Software Revision |
| Manufacturer: | Display of Manufacturer<br>BlueCom AG, Switzerland |
| PIN Change: | Change PIN Code of SETEL-D |

## 5.2   Programming of Function Keys

The function keys F1 to F24 can be pre programmed with speed dial numbers or special functions.
When the function key is pressed the first time then the display will show the following:

Line 1: Function key not programmed
Line 2: ……

By pressing "ok" a key can now be pre programmed with a speed dial number or special function.

Line 1: Function Key:
Line 2: change?

# 6   Installation

## 6.1   Scope of Supply

The SETEL-D unit will be delivered in a box with following items:

1.) SETEL-D body, including handset, display and keyboard
2.) Handset Cord
3.) RJ11 socket 6p/6p
4.) Connection cable RJ11/RJ11 6p/6p , length: 3m

**Optional items:**
To use the E&M wires and external bell of the SETEL-D the following items can be supplied:

1.) Connection cable RJ11/RJ11 6p/6p, length: 3m
2.) RJ11 socket 6p/6p.

## 6.2   Unpacking and Inspection

After Unpacking the SETEL-D, retain the carton and packing materials until the contents have been inspected and checked against packing list. If there is a shortage or any evidence of damage, do not attempt to use the SETEL-D. Contact the carrier and file a shipment damage claim. A full report of the damage should also be reported to BlueCom AG. The following information should be included in the report:
Order number
Equipment Model and Serial Numbers
Shipping Agency
Date of Shipment
The BlueCom Service Department can be reached by phone at ++41 44 748 08 25 and by Fax ++41 44 748 48 19. Upon receipt of this information BlueCom will arrange for repair or replacement of the equipment.

## 6.3   Installation Recommendations

Careful attention to the following installation suggestions should result in the best unit/system performance.
The SETEL-D must be installed indoors. Direct sunlight to the SETEL-D shall be avoided. The ambient temperatures must be between 0 and 45 degrees C.

## 6.4   DC-Power Requirements

The SETEL will operate on a 48V DC power supply. The voltage may be in the range of 36 – 70V DC. If the input voltage exceeds 70V DC, it may result in damage of the equipment. Actual power consumption is less than 2W.

## 6.5   External Connections
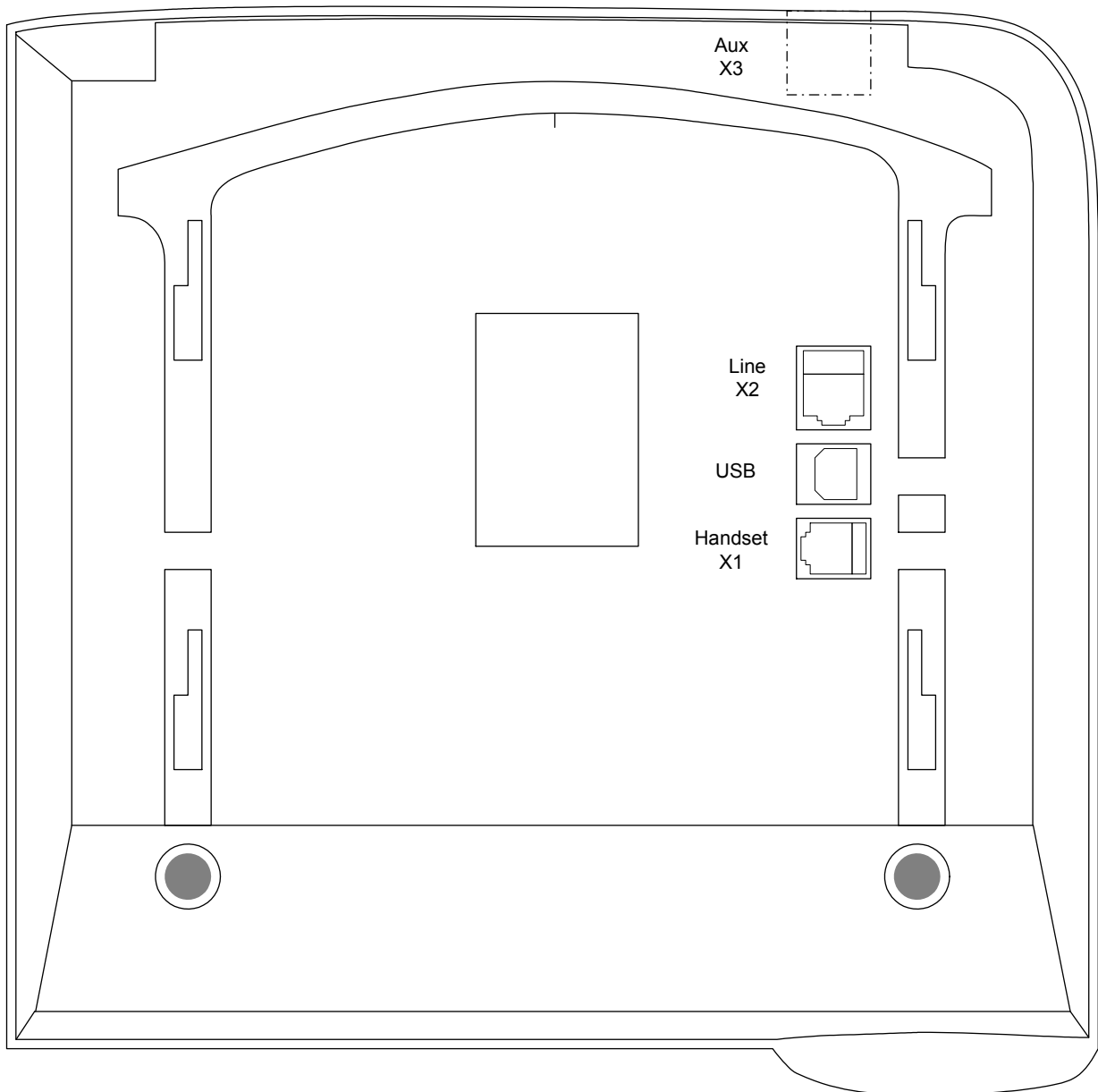


**X1 Microtel**
The microtel is connected to the 4-pin plug X1 on the bottom side of the telephone set.

**X2 Telephone connection** (power supply / Line)
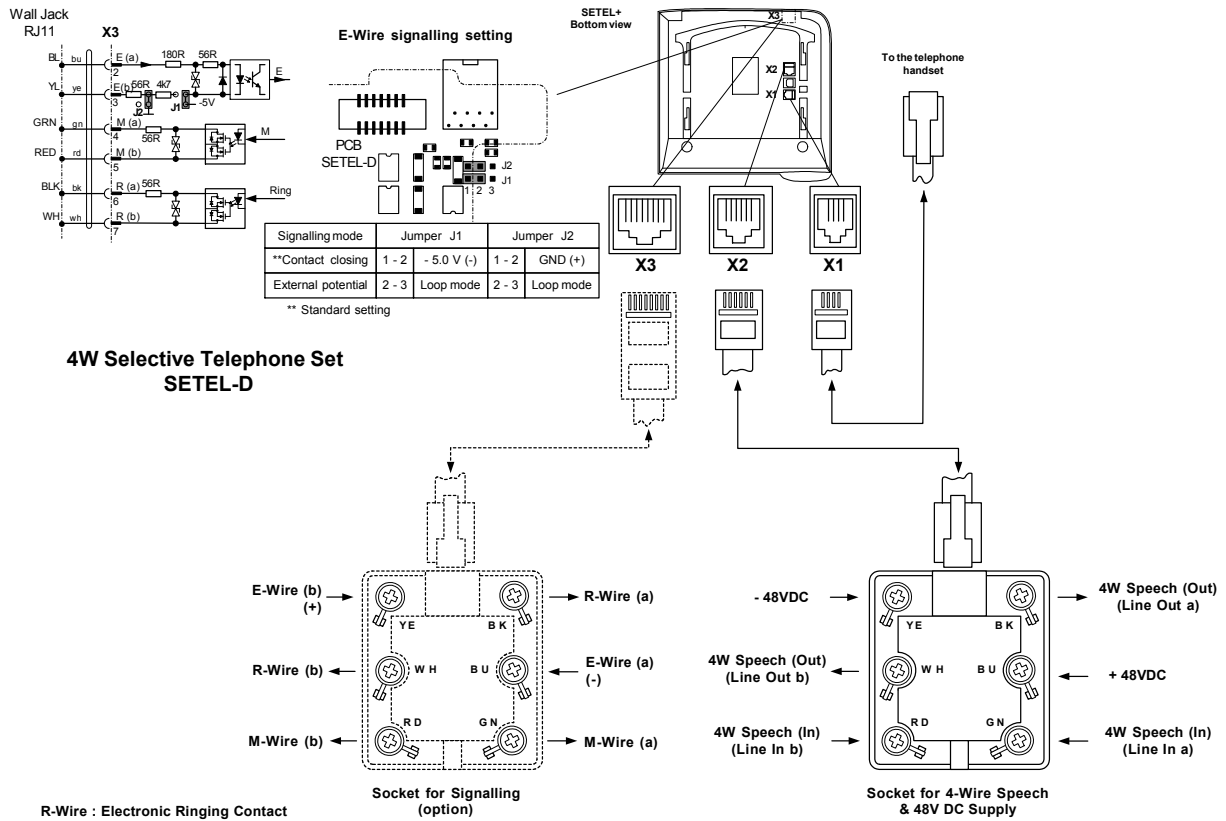To connect the power supply and the four speech wires the 6-pin plug X2 on the bottom side is used.

**X3 Auxiliary signals** (E & M / buzzer contact, connection optional)
The other 8-pin plug X3 on the bottom side can be used to connect the E & M signalling wires and a buzzer contact to switch an external buzzer.
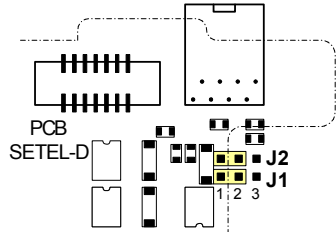
**USB Connector**
To connect the SETEL-D to a Computer or Laptop

## 6.6   Connection Diagram



**Wall Jack RJ11**

**E-Wire signalling setting**

**SETEL+ Bottom view**

**To the telephone handset**

**PCB SETEL-D**

| Signalling mode | Jumper J1 | | Jumper J2 | |
|---|---|---|---|---|
| **Contact closing | 1 - 2 | - 5.0 V (-) | 1 - 2 | GND (+) |
| External potential | 2 - 3 | Loop mode | 2 - 3 | Loop mode |

** Standard setting

**X3**   **X2**   **X1**

**4W Selective Telephone Set SETEL-D**

E-Wire (b) (+)

R-Wire (b)

M-Wire (b)

R-Wire (a)

E-Wire (a) (-)

M-Wire (a)

**Socket for Signalling (option)**

**R-Wire : Electronic Ringing Contact**

- 48VDC

4W Speech (Out) (Line Out b)

4W Speech (In) (Line In b)

4W Speech (Out) (Line Out a)

+ 48VDC

4W Speech (In) (Line In a)

**Socket for 4-Wire Speech & 48V DC Supply**

## 6.7   Jumper Settings:

For the E-Wire there are two jumpers. The default setting can be taken from the diagram below. To change the jumpers the SETEL-D has to be opened.
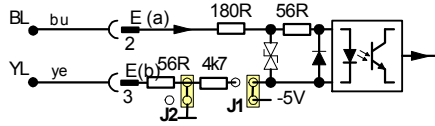


| Signalling mode | Jumper J1 | | Jumper J2 | |
|---|---|---|---|---|
| **Contact closing | 1 - 2 | - 5.0 V (-) | 1 - 2 | GND (+) |
| External potential | 2 - 3 | Loop mode | 2 - 3 | Loop mode |

** Standard setting

**Connector X1: Microtel**

| Pin | Name | Signal |
|-----|------|--------|
| 1 | Mic | Input for microphone |
| 2 | Ear Set | Output for speaker ear set |
| 3 | GND | Signal GND for speaker ear set |
| 4 | Mic GND | Microphone GND for ear set |

**Connector X2: Telephone connection** (power supply / line)

| Pin | Name | Signal |
|-----|------|--------|
| 1 | +48V DC | 48V Power supply positive pole |
| 2 | -48V DC | 48V Power supply negative pole |
| 3 | Line In (a) | 4W-Audio in (a-wire) |
| 4 | Line In (b) | 4W-Audio in (b-wire) |
| 5 | Line Out (a) | 4W-Audio out (a-wire) |
| 6 | Line Out (b) | 4W-Audio out (b-wire) |
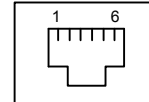
**Connector X3: Auxiliary signals** (E & M / buzzer contact, connection optional)

| Pin | Name | Signal |
|-----|------|--------|
| 1 | Not used | Not used |
| 2 | E (a) | E-wire signalling input (+) |
| 3 | E (b) | E-signalling input (-) |
| 4 | M (a) | M-wire signalling contact |
| 5 | M (b) | M-wire signalling contact |
| 6 | R (a) | Ring wire contact |
| 7 | R (b) | Ring wire contact |
| 8 | Not used | Not used |
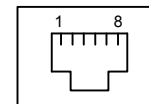
# 7 Technical Data

**Decoder:**

| **DTMF-Decoder:** | Call number | : 1 ... 6 digits (programmable) |
|---|---|---|
| | Group call number | : 1 ... 6 digits (programmable, 2 separate group calls are possible) |
| | Interdigit time | : 5 -99 s (programmable) |

| **DTMF-Receiver:** | Frequencies (Q23) | |
|---|---|---|
| | low group | : 697, 770, 852, 941 Hz |
| | high group | : 1209, 1336, 1477, 1633 Hz |
| | Input levels: | |
| | each tone minimum | : $\geq$ -27 dBm |
| | each tone maximum | : $\leq$ + 3 dBm |
| | Tone duration: | |
| | must accept | : $\geq$ 40 ms |
| | must reject | : $\leq$ 20 ms |

| **DTMF-Sender:** | Summated level | : - 9 dBm |
|---|---|---|
| | Tone burst duration | : 50 ms 50, 100, 200, 400 ms (programmable) |

**Telephone Interface:**

| **AC-Level:** | Speech input (a1, b1) | : -3.0 dBr, 600 $\Omega$ |
|---|---|---|
| | Speech output (a2, b2) | : -3.5 dBr, 600 $\Omega$ |
| | Echo attenuation | : > 20 dB |
| | Long. earth balance attn. | : > 55 dB |

| **Ringback tone:** | Level with 600 $\Omega$ termination | : -15 dBm, 425 Hz |
|---|---|---|

| **Ringing:** | Type of ringing | : 1 / 4 sec, 0.5/0.5/0.5/3.5 sec or continuous (programmable) |
|---|---|---|
| | Ringback time | : 15, 30, 60 s or unlimited (programmable) |

| **DC-Level:** | Input E (Opto coupler) | : $\leq$ 70 V DC, $\geq$ 20 V DC, $R_{inp}$ = 5 k$\Omega$ |
|---|---|---|
| | Output M (SS-Relay) | : $\leq$ 100 V DC, : $\leq$ 200 mA DC |
| | Output R (SS-Relay) | : $\leq$ 100 V DC, : $\leq$ 200 mA DC |

## General Specification:

| | | |
|---|---|---|
| **Power Supply:** | Input voltage | : 36 ... 70 V DC |
| | Max. input voltage ripple | : $\leq$ 1 V pp |
| | Input current | : $\leq$ 50 mA |
| | | |
| **Ambient cond.:** | Operating range | : 0 °C ... 45 °C |
| | Transportation and storage | : -20 °C ... 55 °C |
| | Humidity (non condensing) | : $\leq$ 90 % |
| | | |
| **Mechanical:** | Dimensions | : 235 x 225 x 110 mm |
| | Weight | : 1100 g |
| | Colour | : black |
| | Mounting | : Desk or wall mounting |
| | LCD-Display | : 2 lines by 24 characters |
| | | |
| **Connections:** | Telephone connection | : 6-pin cable (3 m long) with RJ12 plug and wall mounting jack |
| | Buzzer contact / E&M (optional) | : 6-pin cable (3 m long) with RJ12 plug and wall mounting jack |