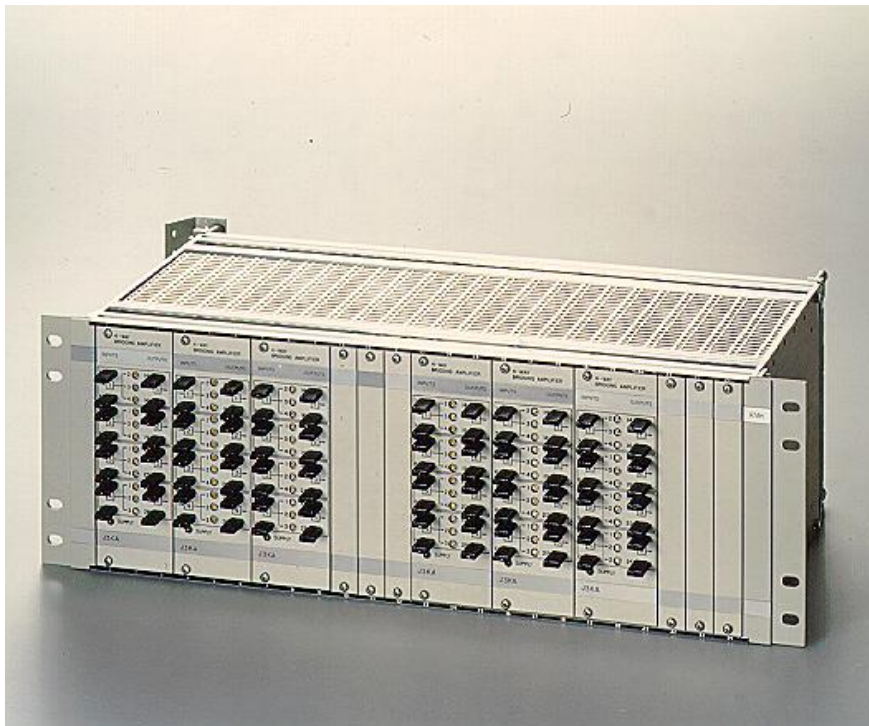


PLTS

System Description



Party Line Telephone System

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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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PLTS Rack Factory Test Protocol	BCPT1010.FP.E0
PLTS Rack Commissioning Test Protocol	BCPT1010.CP.E0
Standard Drawing SETEL to PLTS	BC980117

1 Introduction

A party line telephone system (PLTS), as described below, is a system with permanently connected subscribers and featuring selective calling. It is especially suited for small private telephone systems with relatively few subscribers and low traffic density. However, more and more large electric utilities favour a separation of their operational and administrative telephone system and use a party line system for their operational needs.

The system described below makes use of standard in-band touch tone signalling tones (DTMF) for selective calling. Furthermore, all connections throughout the system are on a 4-wire basis up to the telephone microphones and receivers. When combined these features, provide the following advantages.

- Echo free reception at good levels
- Fast signalling
- Easy expandability requiring no changes in the existing installation
- Solid state plug-in type modules provide for good maintainability
- Easy of establishing multi-party conference calls by simply dialling several numbers in sequence
- Design flexibility. The system modularity allows adaptation to almost any customers requirements.
- Low capital outlay

A party line telephone system consists of trunk path interconnecting several geographically separated stations and one or several local drops to subscriber telephone sets within a station. The trunk path may consist of any combination of radio, pilot cable, microwave, fibre or power line carrier links and may be designed in straight-line, star or ring configuration or any combination thereof. The described system consist of a 19" rack R7AH where bridging amplifiers type J3KA can be installed. As a 4W telephone set a SETEL can be connected to the bridging amplifiers. The SETEL is a 4-wire telephone set, with a selective DTMF number decoder.

The bridging amplifier module J3KA serves as a combining unit for four 4-wire audio circuits. It is well suited for speech as well as voice data party line applications.

Signals applied to an input of the J3KA are passed to all remaining outputs except its own. Example: A signal applied to input 1 is passed to outputs 2, 3 and 4 but not to output 1.

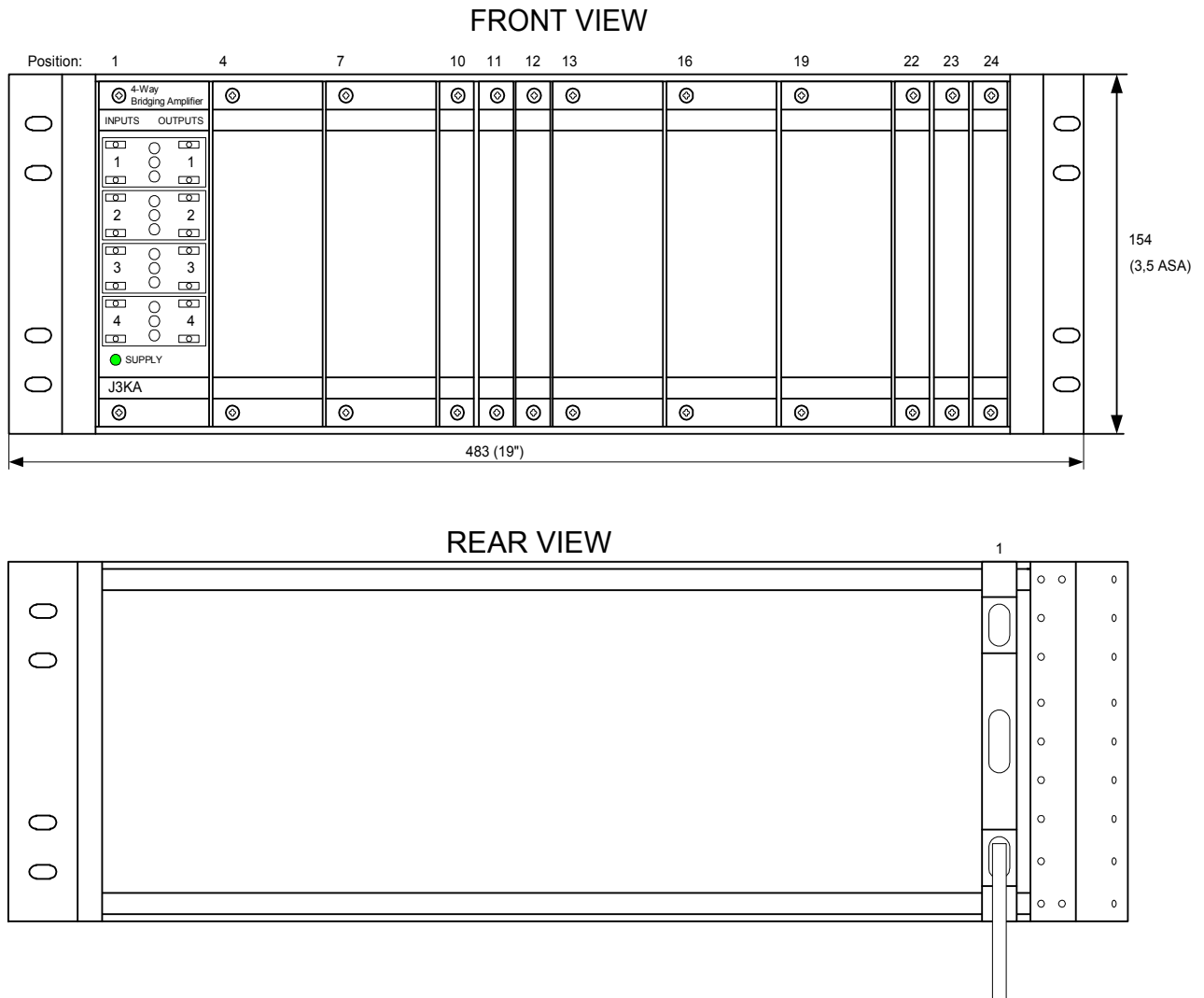
By means of twelve potentiometers the gain of any of these input to output paths can be adjusted individually. Further, by means of jumpers, one of three coarse gain ranges can be selected. The maximum voltage gains are as follows: low 6dB, medium 18dB, high 30dB. Maximum output level is +16dBm when operated from a -48V supply or +10dBm when operated from a -24V supply.

Inputs and outputs are 600Ω balanced, and are provided with interruptable testjacks.

Operation is from an unregulated DC supply of either -24 or -48V. The appropriate range can be selected by means of a jumper. On the frontplate a green LED is provided for supply indication.

2 Mechanical Design

The bridging amplifiers J3KA are housed in a 19" MES rack R7AH. Up to 8 bridging amplifiers can be installed in a single rack.



2.1 Interface J3KA

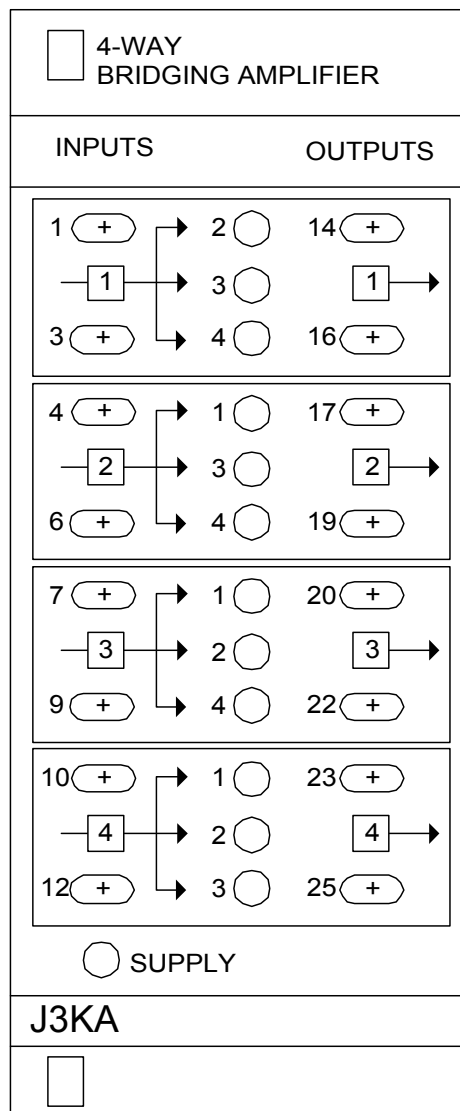
The J3KA module is 3.5 ASA units high and 3 divisions wide. Its mechanical construction conforms to the ABB MES standard. Each bridging amplifier has its connecting cable V9CT.

The circuitry is arranged on three printed circuit boards which are designated Na, Nb and Nc. Na is the main board. It is fitted with an edge connector and contains the input testpoints, input and output transformers and the supply circuits. Nb comprises the amplifiers with the potentiometers for the gain adjustment. Nc contains the output testpoints.

2.2 J3KA Frontpanel

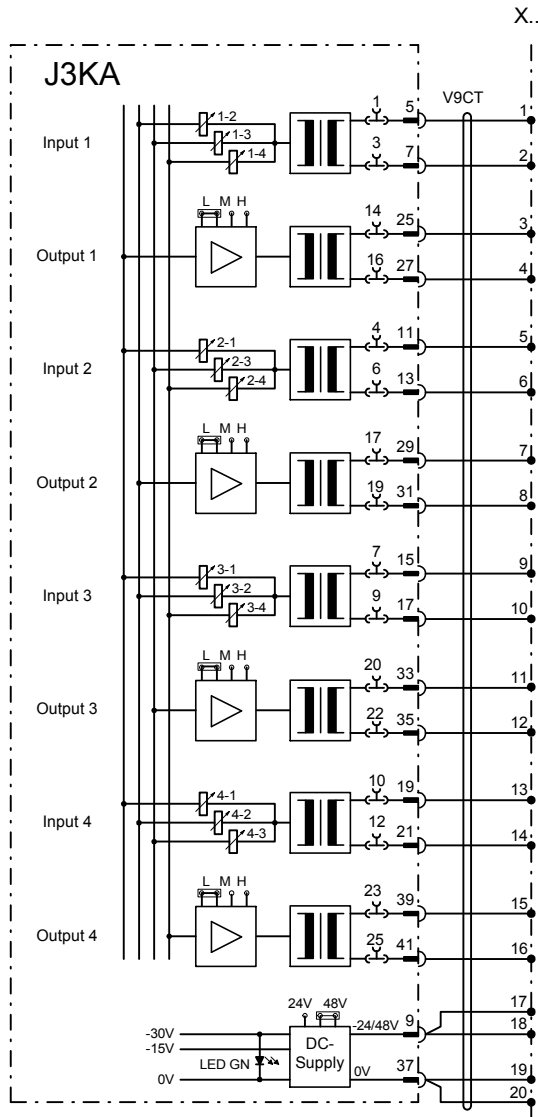
To facilitate commissioning and maintenance of a system, the frontpanel of the bridging amplifier is equipped with the following:

- Testpoints on inputs and outputs
- Potentiometers for level adjustments
- A light emitting diode (LED) for supply indication



3 Functional Description

3.1 Block Diagram



- Testpoint 14 and 16 Output 1
- Testpoint 17 and 19 Output 2
- Testpoint 20 and 22 Output 3
- Testpoint 23 and 25 Output 4

3.4 J3KA Potentiometers

Twelve multiturn potentiometers are provided which allow individual adjustment of each input to output path.

They are arranged in four groups of three potentiometers each as follows:

- Group 1 controls signals from input 1.
 - Potentiometer 1 to output 2
 - Potentiometer 2 to output 3
 - Potentiometer 3 to output 4
- Group 2 controls signals from input 2.
 - Potentiometer 1 to output 1
 - Potentiometer 2 to output 3
 - Potentiometer 3 to output 4
- Group 3 controls signals from input 3.
 - Potentiometer 1 to output 1
 - Potentiometer 2 to output 2
 - Potentiometer 3 to output 4
- Group 4 controls signals from input 4.
 - Potentiometer 1 to output 1
 - Potentiometer 2 to output 2
 - Potentiometer 3 to output 3

In addition to the potentiometers, jumpers are provided for range selection (see 4.2 below).

3.5 J3KA Light Emitting Diode

A green LED on front panel (Light Emitting Diode) is provided which lits during normal operation of the bridging amplifier. The LED turns on when sufficient supply voltage is present for the voltage regulator to operate in its assigned range.

4 J3KA Programming

The following functions are programmable and should be checked before the amplifier is utilized:

- Supply voltage range: -24 or -48 V (nominal)
- Gain range: Low, Medium or High

4.1 Supply Voltage Range

Two supply voltages can be used with the bridging amplifier: -24 V or -48 V. A jumper is provided on the main PC board (Na).

Note: When the bridging amplifier is operated from a -24 V supply the maximum output level is reduced to +10 dBm.

4.2 Gain Range

In addition to the adjustment by the potentiometers (described in 3.4), three coarse gain ranges are provided for each output. The range selection can be made by means of jumpers located on the Nb board as follows:

Desired gain	Range selection	Port 1	Port 2	Port 3	Port 4
≤ 6 dB	Low	J1 L	J2 L	J3 L	J4 L
+6...+18 dB	Medium	J1 M	J2 M	J3 M	J4 M
+18...+30 dB	High	J1 H	J2 H	J3 H	J4 H

The jumpers are located on the Nb board and can be changed without dismantling the unit. They are arranged in a row as follows:

Port 1 Bottom jumper J1
Port 2 Third jumper from top J2
Port 3 Second jumper from top J3
Port 4 Top jumper J4

4.3 Factory Programming

If not specified otherwise the J3KA's will be factory adjusted as follows:

- Supply voltage -48 V
- Gain range: "Low"
- Gain: 0 dB

5 J3KA Technical data

5.1 Supply

Input voltage range	
"-48V"	-40..-60 V
"-24V"	-20..-30 V
Maximum input voltage ripple	2 V _{pp}
Supply current	≤ 80 mA

5.2 Inputs

Impedance	600 Ω, balanced
Return loss, 300...3400 Hz	≥ 14 dB
Maximum input level	+16 dBm

5.3 Outputs

Impedance	600 Ω, balanced
Return loss, 300...3400 Hz	≥ 14 dB
Maximum output level	
48 V supply	≥ +16 dBm
24 V supply	≥ +10 dBm

5.4 Amplifier

Gain	Continuously adjustable by means of multiturn potentiometers
Ranges	
low	≥ 6 dB
medium	≥ 18 dB
high	≥ 30 dB
Frequency response, 300...3400 Hz, reference 800 Hz, 0 dB gain, +16 dBm out	± 1 dB
Harmonic distortion	
400 Hz, 0 dB gain +16 dBm out	≤ 0.5 %
Output noise	
300...3400 Hz, 0 dB gain	≤ -70 dBm
Crosstalk, 300...3400 Hz, 0 dB gain, 0 dBm output	
Input 1 to Output 1	-65 dB
Input 2 to Output 2	-65 dB
Input 3 to Output 3	-65 dB
Input 4 to Output 4	-65 dB

5.5 Ambient condition

Operating range:	0...55°C
Transportation and storage:	-20...55°C
Humidity (non condensing):	max. 90%

5.6 Mechanical

Type	printed circuit board 3.5 ASA units high 3 divisions wide
Coding between contacts	33/35, 37/39, 41/43

6 Functional Test

See factory test protocol BCPT1010.FP.E0

7 Installation

7.1 Unpacking and Inspection

After Unpacking the unit, 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 equipment. 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 1 748 48 18 and by Fax ++41 1 748 48 19. Upon receipt of this information BlueCom will arrange for repair or replacement of the equipment.

7.2 Installation Overview

The following steps are needed to properly install the PLTS System:

Provide mechanical mounting for the unit. The Rack R7AH can be installed in a standard 19" cabinet by its front panel.

Provide the proper primary power for the bridging amplifiers J3KA.

Connect the SETEL phones to the V9CT cables.

Interconnect the unit with the communication system via the V9CT cable delivered with each bridging amplifier J3KA.

7.3 Installation Considerations

Careful attention to the following installation suggestions should result in the best unit/system performance.

The PLTS system must be installed in an environment, which provides both protection from the weather and assurance of ambient temperatures between 0 and 55 degrees C. Since the unit is neither splashproof nor corrosion resistant, it must be protected from exposure to salt spray. When the unit is mounted in a cabinet with other heat-generating equipment, keep 1 HE free air space above and below the R7AH rack.

7.4 DC-Power Requirements:

The J3KA will be delivered from the factory with the supply jumper set to 48V DC. The J3KA Amplifiers operate on a 48V DC or 24V DC power supply. First check right jumper setting. Following voltage range has to be met:

Jumper on 48V DC: -40 ... -60V

Jumper on 24V DC: -20 ... -30V

If the input voltage exceeds the maximum voltage stated above it may result in damage of the equipment. Power consumption of each J3KA is less than 5W.

7.5 External Interconnect Information

Please find on the standard drawing BC980117 a typical wiring configuration.