

Combined External Circuitry  
for ISDN S/T and U<sub>p</sub> Interface

U<sub>p</sub> Universal S<sub>0</sub>  
ISDN Port



March 2004

# Introduction

In ISDN technology there are three types of interfaces for ISDN Basic Rate Interface:

## **S/T Interface ( $S_0$ )**

4-wired, with separate pair of wires for transmit (TX) and receive (RX) direction



millionfold approved  
in the field

## **$U_p$ Interface**

2-wired, with ping-pong technique, depending on possible cable range divided in  $U_{pN}$  and  $U_{p0}$

> In the following called  $U_p$



integral part of all new  
Cologne Chip products

## **$U_{k0}$ Interface**

2-wired, with echo cancellation



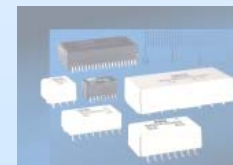
not planned

## Initial Situation

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At the present moment **different transformer types** and line interface circuitries are required for the S/T and  $U_p$  interface standards.

Especially in NT mode the power feeding has to be realized in different ways. The ISDN controller ICs on the market capable of switching between S/T and  $U_p$  require this **adaption effort** (e.g. DELIC / VIP).



## New from Cologne Chip: Combined Circuitry

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This new Cologne Chip design makes it possible to implement a circuitry that can easily **be switched between S/T and  $U_p$  configuration** by using a few additional jumpers.

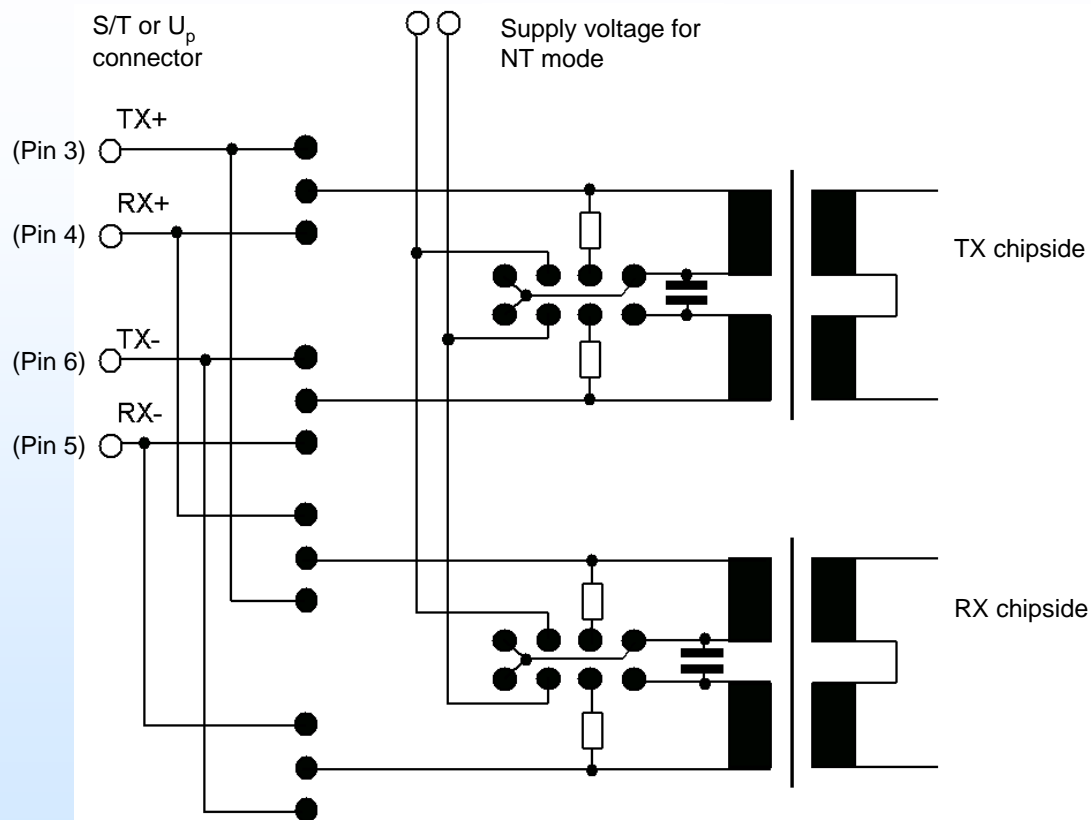
The design concept: For S/T and  $U_p$  only one circuitry and even the **same S/T transformer modul** is used. The operation mode is set by **jumpers**. The line interface power feeding of the different configurations for S/T and  $U_p$  in NT mode is realized through two additional jumpers.

Because of the turns ratio of 2:1 of the transformer a **greater signal range** is attained and in addition **supply power is saved**.

Patent pending

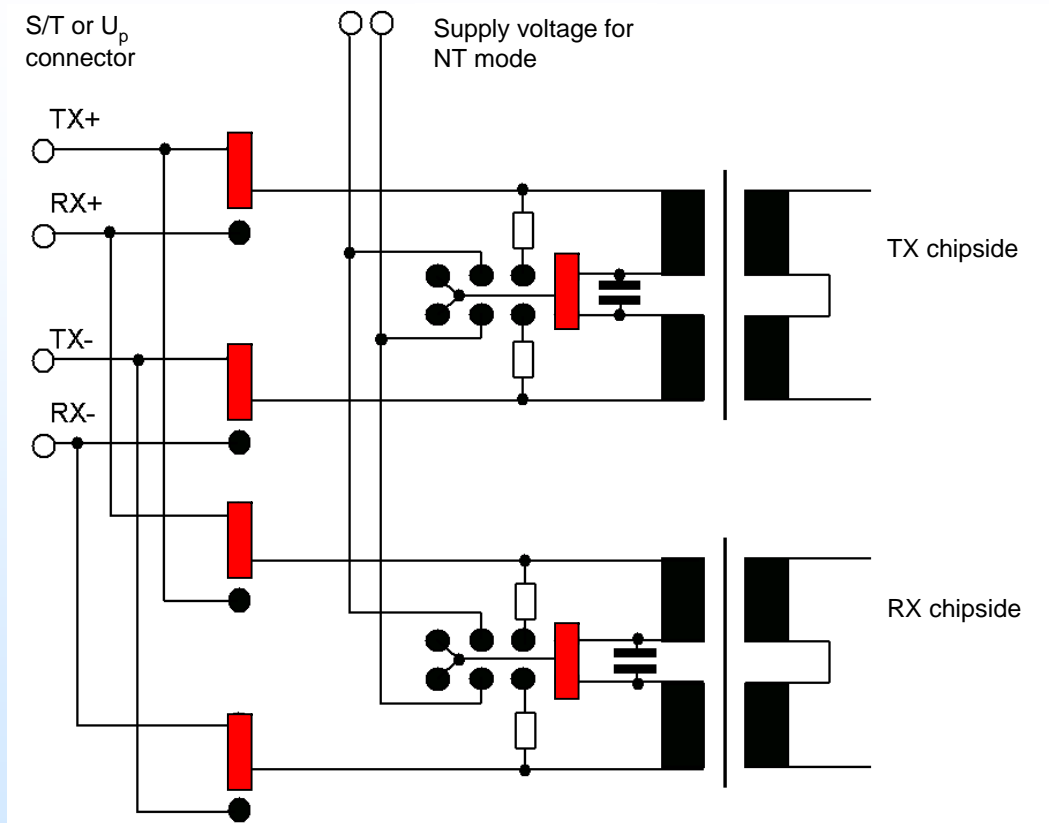


# Combined Circuitry with open jumpers

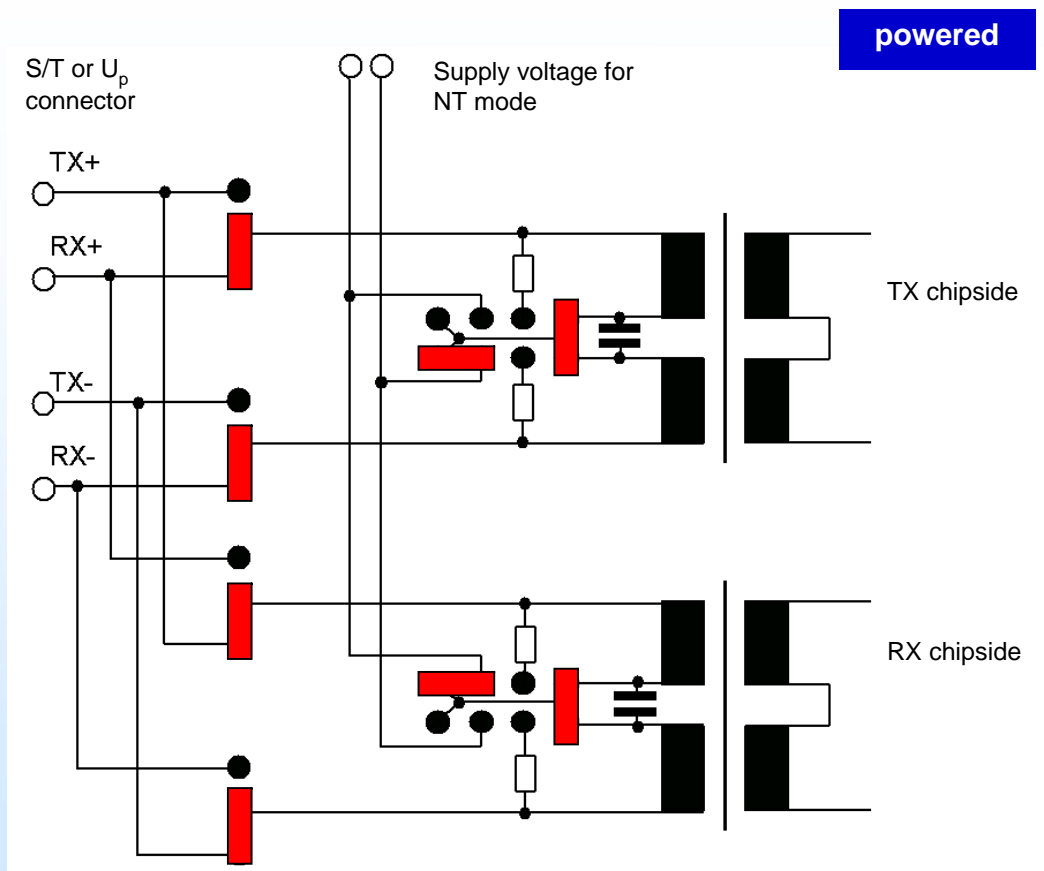


# Combined Circuitry for S/T in TE mode

[ Configuration 1 ]



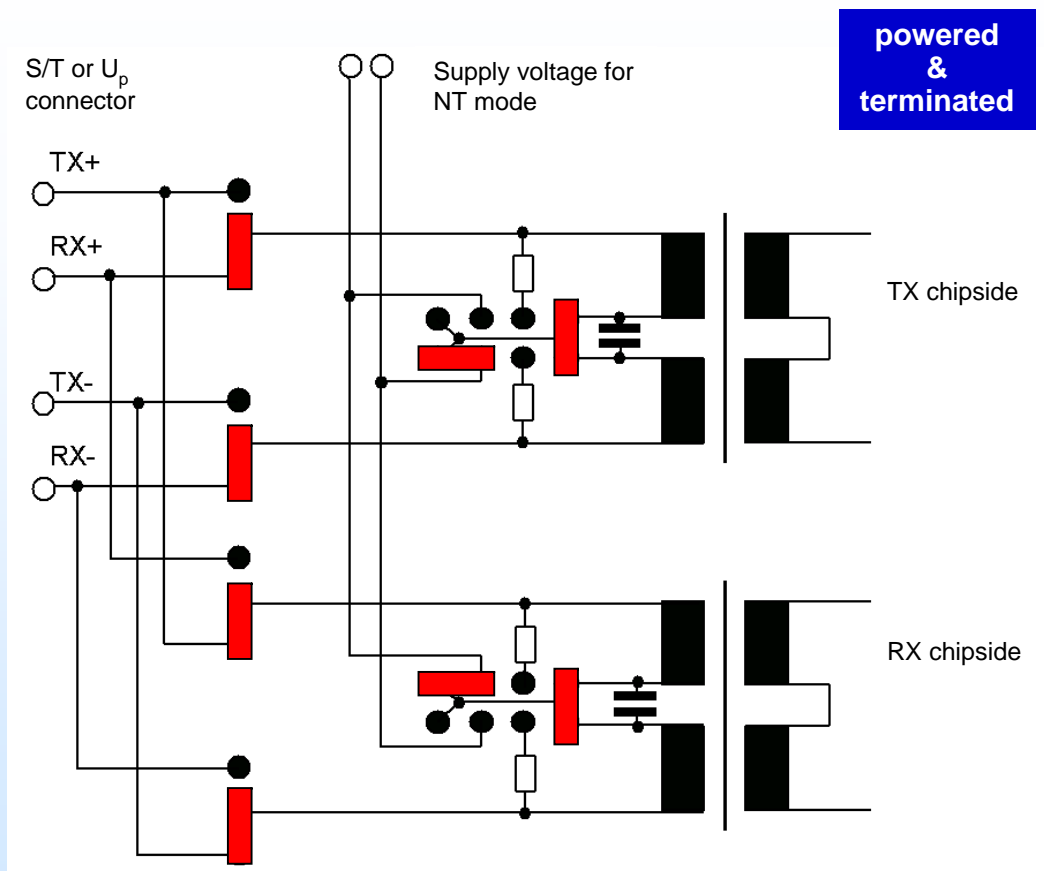
# Combined Circuitry for S/T in NT mode



[ Configuration 2 ]



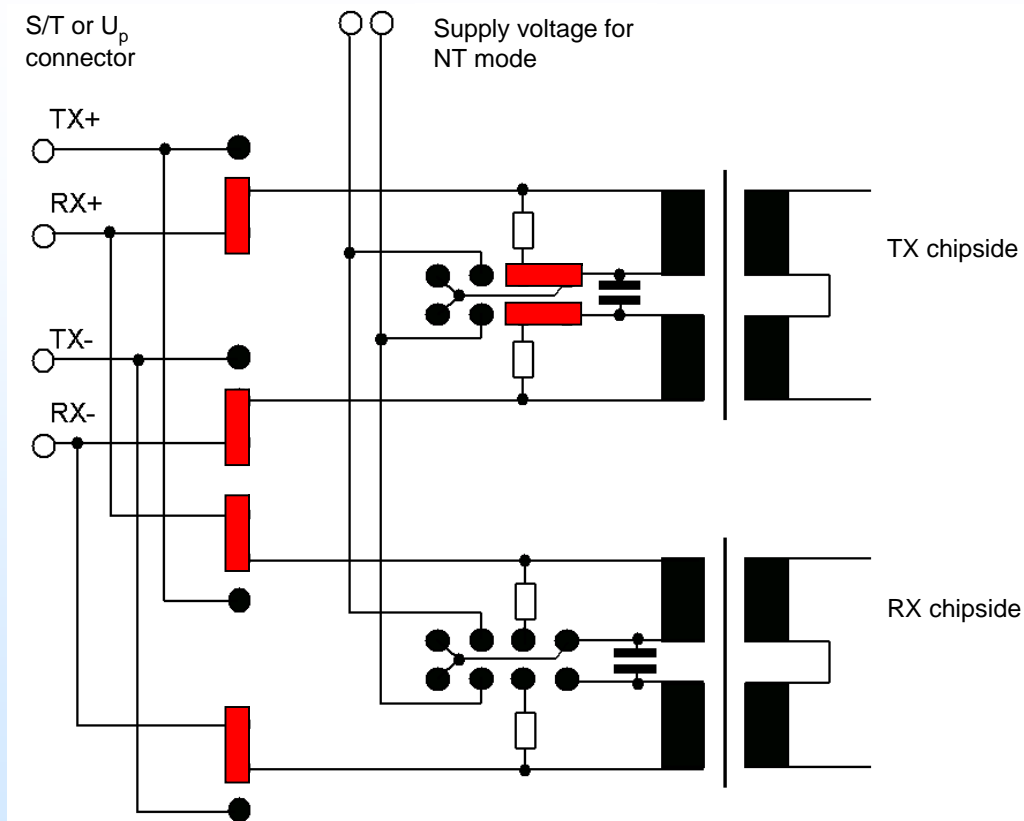
# Combined Circuitry for S/T in NT mode



[ Configuration 3 ]



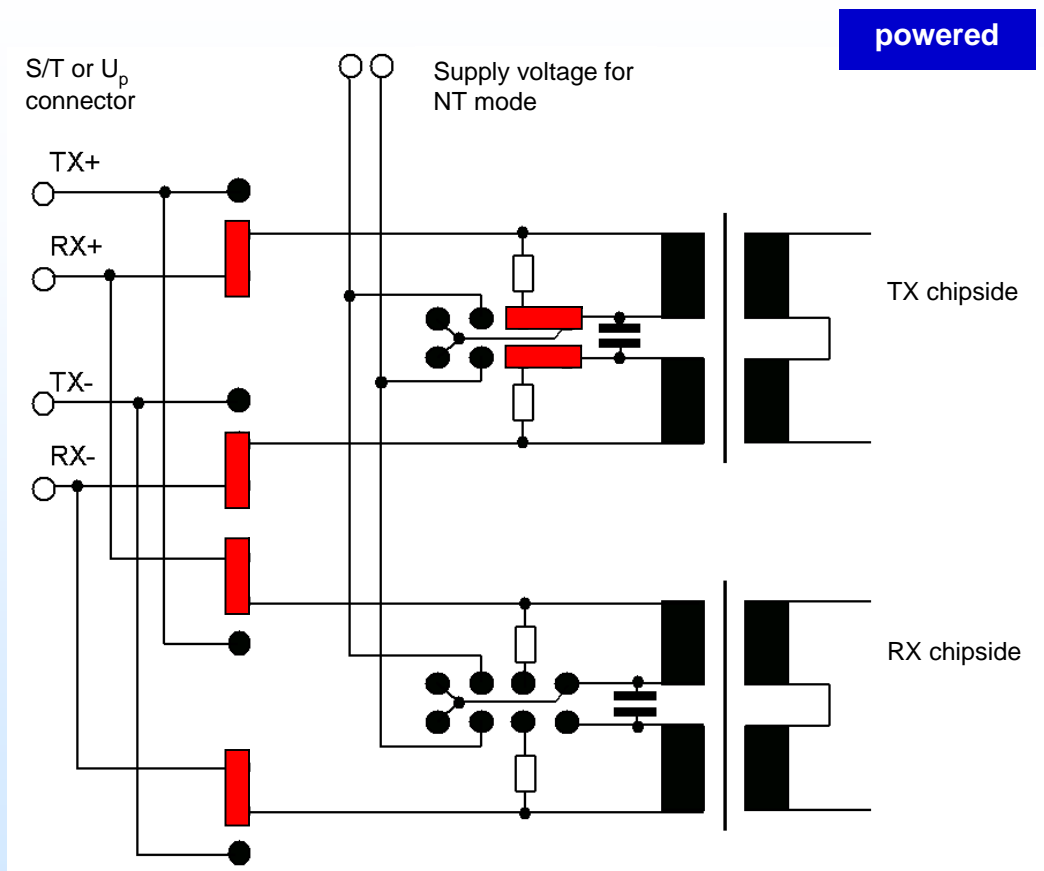
# Combined Circuitry for $U_p$ in TE mode



[ Configuration 4 ]



# Combined Circuitry for $U_p$ in NT mode



[ Configuration 5 ]



## Advantages of the Cologne Technology

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- ✓ Only **one PCB layout** for all configurations
- ✓ Same **transformer modul**
- ✓ No **stocking** of different transformers
- ✓ Only few **jumpers** required
- ✓ Significantly smaller **power consumption** for S/T interface
- ✓ Higher **receiver sensitivity** and hence greater **signal range**

