

Stollmann E + V GmbH	TA+SOC DesignGuide
-------------------------	-----------------------



TA+SOC

DesignGuide

Rev 2.2



Content

1	Objective.....	3
2	Product description	3
3	Software interfaces	4
3.1	Dialing procedures	4
3.2	AT commands.....	4
3.2.1	Configuration commands	4
3.2.2	AT connection commands.....	4
3.3	Auto-connect.....	5
3.4	CAPI	5
3.5	ISDN interface	5
3.6	Configuration/updates.....	6
3.7	Firmware updates	6
3.8	Management.....	6
3.9	Security.....	6
4	Dimensions	7
5	Hardware interfaces.....	8
5.1	Power supply	8
5.1.1	Power consumption and power down modes.....	8
5.2	ISDN interface	8
5.3	Serial interface.....	8
5.4	IOM-2 interface (PCM).....	9
5.5	Electrical specifications.....	9
5.6	Connector layout.....	10
5.7	Pin layout.....	11
*	different for TE and LT-S mode, see comment	12
5.7.1	Connector type	13
6	Available models.....	13

1 Objective

This DesignGuide documents how TA+SOC can be integrated into customer systems. It addresses developers of hardware and software environments for TA+SOC. For detailed information about technical data refer to the manual.

Since TA+SOC is under permanent further development, some information might alter. The following documentation is therefore meant to provide an overview. Stollmann expressly declares that this DesignGuide is no basis for a layout.

This documentation is a recommendation to the best of our knowledge. Stollmann does not assume any liability for the information in this documentation nor for any damages related to or caused by the use of this Design Guide.

2 Product description

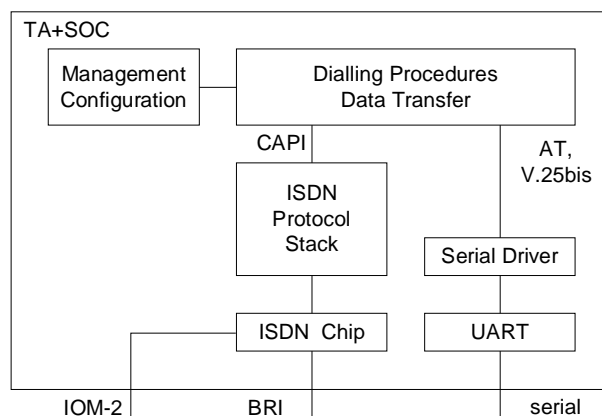
TA+SOC connects an asynchronous serial interface with TTL level with the ISDN BRI (S0, I.430) interface.

At the serial port it is modem compatible supporting AT-commands to control the ISDN link. Additional dialing procedures are available like Auto-connect, V.25bis and CAPI.

The ISDN BRI interface complies to the S bus I.430 specification. Several D-channel protocols like DSS1 are available.

On the B-channel a variety of protocols like HDLC, X.31 and V.110 are supported allowing the TA+SOC to be used in all typical applications using ISDN data connections.

For transparent B channel access the IOM-2 interface is available for connections to PCM lines, Codecs etc.



3 Software interfaces

3.1 Dialing procedures

The following dial procedures are supported:

- AT commands
- V.25bis async
- Auto-connect (Hotline call)
- X.3 PAD
- CAPI

3.2 AT commands

Via AT-Commands you may control the ISDN connections and change the configuration of TA+SOC. ISDN specific configuration commands are supported.

3.2.1 Configuration commands

A range of parameters can be controlled by configuration commands of TA+SOC as listed below:

- Setting own msn number
- to be used B channel protocol
- characteristics of serial interface (baud rate, data flow control, etc.)
- AT/Auto-connect operation mode
- Firmware download

3.2.2 AT connection commands

Command	Function	Response
ATDxxx	Establishes a ISDN connection	Connect
ATH	Disconnects the ISDN Connection.	OK

Whenever the ISDN connection with a communication partner is established, a transparent channel for serial data is provided.

A detailed description of the AT-Commands is found in the TA+SOC manual.

3.3 Auto-connect

In case the ISDN connection should be used like a fixed line the TA+SOC auto-connect mode can be configured.

Several triggers (i.e. DTR active) may be defined which start the connection setup.

TA+SOC then behaves at the serial interface as a cable which is plugged in by establishing the ISDN connection.

Trigger	Function	Parameter
DTR active	ISDN Connect	ISDN number
Power on	ISDN Connect	ISDN number
Transmit data activity	ISDN Connect	ISDN number
ISDN link request (incoming)	Accept incoming call	None

3.4 CAPI

The CAPI is a standardized application program interface (API) for ISDN interfaces. It supports establishing connections and data transfer and can be used by several application programs concurrently. This allows it to be used very flexibly for a wide range of applications. In most cases, the CAPI is used to interface internal ISDN PC boards. Stollmann has made the CAPI available for applications working with the TA+SOC using the serial interface. The CAPI can be used wherever the possibilities of AT commands are limited.

To use the CAPI, the application program must be modified to work with the CAPI. To this end, Stollmann offers a development kit with sample programs and programming aids.

3.5 ISDN interface

ISDN specification	S0 I.430
D-channel protocols	DSS1 VN 4 National Bellcore 1-2 (NI1/2) 5ESS JATE INS NET TPH 1962 X.31 D-channel

B-channel protocols	HDLC-transparent PPP sync-async BAP/BACP/ML-PPP X.75 bit-transparent X.31/X.25 V.110/ECMA 102 V.120
---------------------	--------------------------------------------------------------------------------------------------------------------------

3.6 Configuration/updates

The TA+SOC can be updated locally via the serial interface or via ISDN. For configuration via ISDN, a connection is established with the internal configuration module. From that point, configuration is effected as if via the local serial interface.

3.7 Firmware updates

Firmware updates can always be effected via the local serial interface. It is also possible to update the firmware via the ISDN line if the TA+SOC has extended memory (4 MB flash memory) installed.

3.8 Management

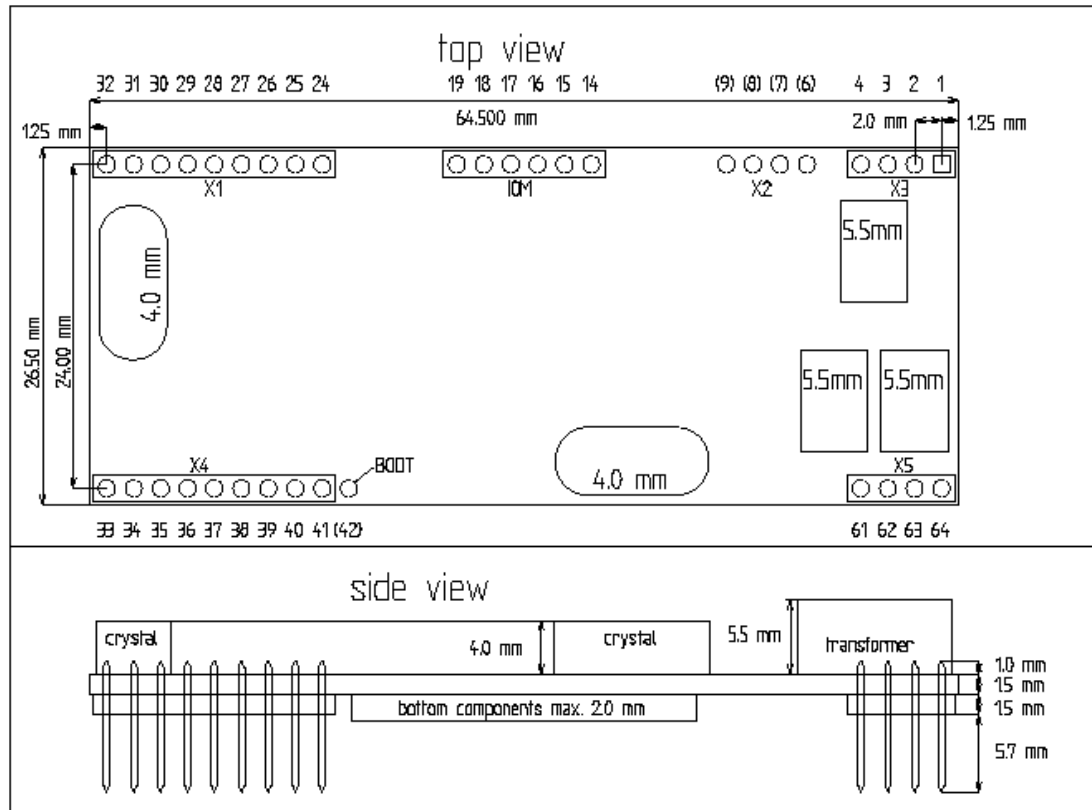
The TA+SOC features an integrated trace mode that can log internal communications at different levels. These internal logs can be read using specific commands and transmitted for subsequent analysis.

The TA+SOC has an external logging mode logging external activities in a ring buffer. These external logs can be read using specific commands.

3.9 Security

The configuration data can be accessed through the ISDN line to allow remote support and configuration. Connection and access to configuration data can be protected against unauthorized use. This can be done either by defining a password or by restricting access to a number of preselected phone numbers (white list access table).

4 Dimensions



TA+SOC Dimensions	Europe	US
Width	26,5 mm	~1.05"
Height	14 mm	~0.55"
Length	64,5 mm	~2.55"
Weight	~ 12 g	~ 0.42 oz
Operating temperature	0...70 °C	32...160 °F
Storage temperature	-10...85 °C	14...185 °F
Humidity	90% non-condensing	90% non-condensing

5 Hardware interfaces

The TA+SOC is connected via the connectors X1 to X5. This includes:

- Power supply
- Asynchronous serial communication interface (V.24/RS-232 with TTL level)
- ISDN interface

5.1 Power supply

The TA+SOC needs to be powered by 3,3 V \pm 5% low noise, the supply voltage is used directly (0 Ohm).

5.1.1 Power consumption and power down modes

To reduce power consumption of the TA+SOC, a power down mode is activated automatically by the TA+SOC.

The following values are approximate power consumption values in the different states:

Condition	Power usage
Power down	~ 20 mA
ISDN active	~ 30 mA

5.2 ISDN interface

The four lines of the ISDN interface are connected both to X2 and X3 in parallel. You may use the pins on X2 or on X3 to connect it to the RJ45-ISDN jack on the base PCB. X3 is preferred. You should leave the not used pins unconnected on the base PCB. The signals should be routed directly to the ISDN connector on the base PCB without additional components. Below the traces between the pins of TA+SOC and the RJ45 jack on the base PCB there should be no power and ground planes. A distance of 2,5 mm should be kept to all other signals on the base PCB. A current-compensated choke is integrated on the TA+SOC.

The assignment of the ISDN pins of X2 and X3 to the pins of the ISDN connector can be found in the list below.

5.3 Serial interface

TA+SOC has an asynchronous serial interface with TTL level.

Stollmann	TA+SOC
E + V GmbH	DesignGuide



- Transmission speeds 300 – 230,400 bps (asynchronous), automatic baud rate detection
- Character representation:
7 bit / 8 bit
no, even, odd parity,
1, 2 stop bit
Half duplex or full duplex
- Flow control hardware (RTS/CTS)

5.4 IOM-2 interface (PCM)

TA+SOC has an synchronous interface time slot oriented with TTL level. This interface is according to the rules of the IOM-2 of the specification by Infineon ISDN devices.

TE-Mode:

- Bit clock frequency 768 kHz will be delivered by the module (output)
- Frame sync 8 kHz will be delivered by the module (output)
- SDS denotes the used time slot for B channel information (output)

LT-S-Mode:

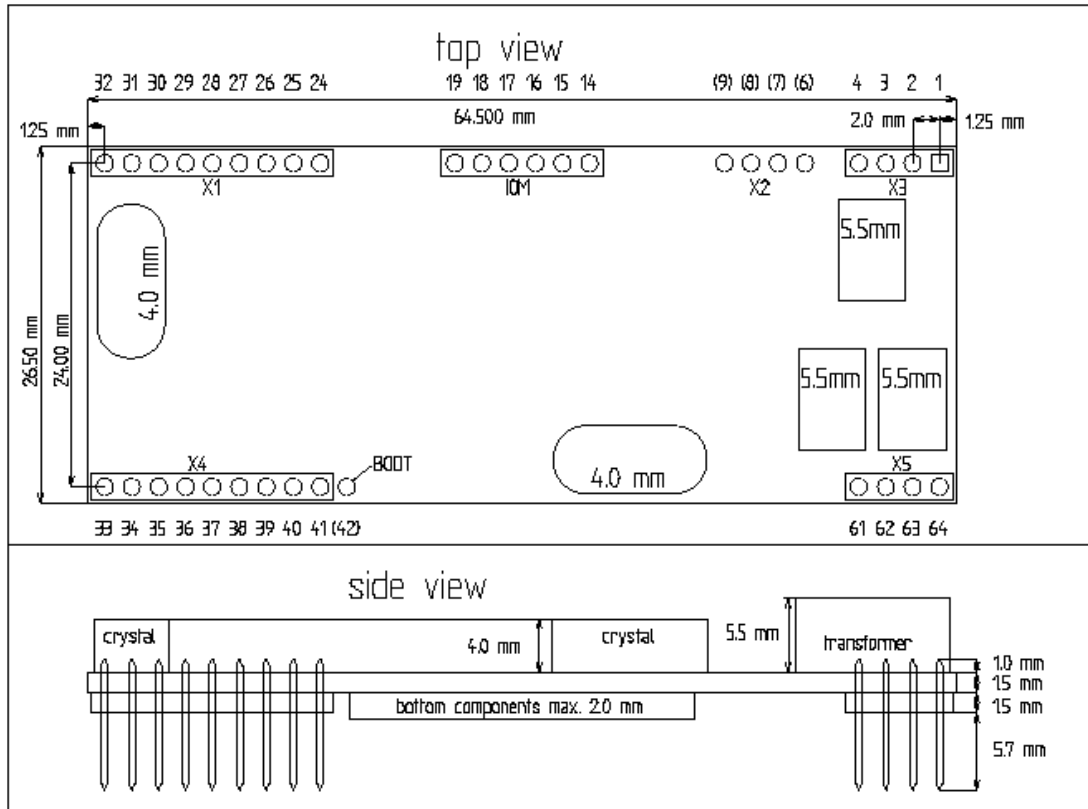
- Bit clock frequency 768 kHz must be input ##
- Frame sync 8 kHz must be input
- SDS denotes the used time slot for B channel information (output)

5.5 Electrical specifications

The signal levels of the ISDN interface comply to the ISDN specification.

The signal levels of the serial and GPIO interface are TTL level 3.3 V compatible.

5.6 Connector layout



5.7 Pin layout

Bottom view (to pins)

PIN Assignment

64	NC
63	GND
62	NC
61	VCC
60	No pin
59	No pin
58	No pin
57	No pin
56	No pin
55	No pin
54	No pin
53	No pin
52	No pin
51	No pin
50	No pin
49	No pin
48	No pin
47	No pin
46	No pin
45	No pin
44	No pin
43	No pin
42	No pin, Bootmode
41	GND
40	-DTR(I)
39	-DCD(O)
38	-CTS(O)
37	-DSR(O)
36	-RI(O)
35	-TxD (I)
34	-RxD(O)
33	-RTS(I)

Assignment PIN

TX+	1
TX-	2
RX+	3
RX-	4
No pin	5
TX+, No pin	6
RX+, No pin	7
RX-, No pin	8
TX-, No pin	9
No pin	10
No pin	11
No pin	12
No pin	13
IOM Bit clock BCL (O)	14
Data upstream DU (O)	15
Data downstream DD (I)	16
Frame sync FSC (O)	17
Double bit clock DCL (O)	18
B Channel Strobe SDS (O)	19
No pin	20
No pin	21
No pin	22
No pin	23
-RESET(I)	24
NC	25
GND	26
UA LED1 (O)	27
L3 LED2 (O)	28
NC	29
UA2 GPO 1 (O)	30
UE GPI (I)	31
UE2 GPI (I)	32

Pin	Con	Signal	Dir.	active	TA+SOC usage
1	X3	TX+	O		ISDN Transmit +, RJ45 jack Pin 3, TE-mode
2	X3	TX-	O		ISDN Transmit -, RJ45 jack Pin 6, TE-mode
3	X3	RX+	I		ISDN Receive +, RJ45 jack Pin 4, TE-mode
4	X3	RX-	I		ISDN Receive -, RJ45 jack Pin 5, TE-mode
14	IOM	BCL	O *		IOM Bit clock, LT-S-Mode: Input
15	IOM	DU	I *		IOM data upstream, LT-S-Mode: Output
16	IOM	DD	O *		IOM data downstream, LT-S-Mode: Input
17	IOM	FSC	O *		IOM Frame sync, LT-S-Mode: Input
18	IOM	DCL	O		IOM Double bit clock
19	IOM	SDS	O		IOM channel strobe
24	X1	RESET~	I	L	Reset, may be left open
25	X1	nc			
26	X1	GND			GND (Signal)
27	X1	UA	O	H	To connect to LED1
28	X1	L3	O	H	To connect to LED2
29	X1	nc			
30	X1	UA2	O	H	General purpose Output
31	X1	UE	I	H	General purpose Input
32	X1	UE1	I	H	General purpose Input
33	X4	RTS~	I	L	Request to Send
34	X4	RXD	O	H	Receive Data
35	X4	TXD	I	H	Transmit Data
36	X4	RI~	O	L	Ring Indicator
37	X4	DSR~	O	L	Data Set Ready
38	X4	CTS~	O	L	Clear to Send
39	X4	DCD~	O	L	Data Carrier Detect
40	X4	DTR~	I	L	Data Terminal Ready
41	X4	GND			GND (Signal)
61	X5	VCC	I		+3.3V (Power Supply)
62	X5	nc			
63	X5	GND			GND (Supply)
64	X5	nc			

* different for TE and LT-S mode, see comment

Stollmann E + V GmbH	TA+SOC DesignGuide
-------------------------	-----------------------



5.7.1 Connector type

Pin strips	Fischer elektronik BLY 1...
------------	-----------------------------

6 Available models

Name	Art No.
TA+SOC	52328