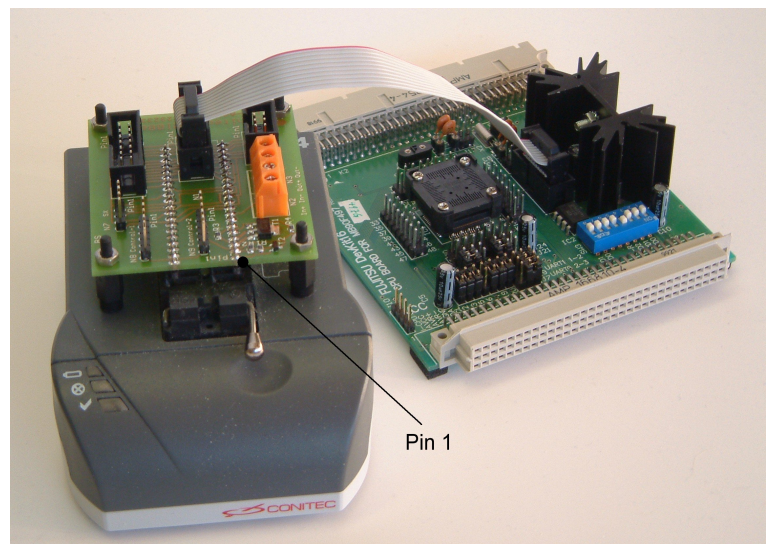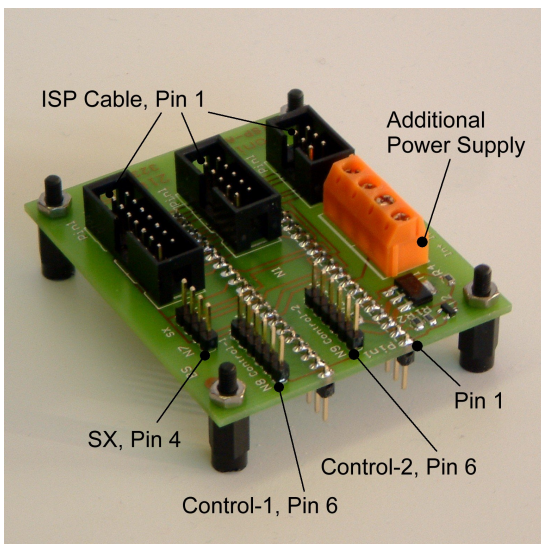|	
-- English --	**-- Deutsch --**
Adapter for MCU's, which are in system programmable.	Adapter für MCU's, die im System programmiert werden können.

ISP Cable, Pin 1

Additional Power Supply

SX, Pin 4

Control-2, Pin 6

Control-1, Pin 6

Pin 1

Pin 1

ISP Adapter

Conitec Part No. 210865

(Valid for SW Release version > 1.16.11)

Common ISP-Adapter Functions for ISP Devices

Galep4 Pin No.	ISP Connector function	Description
40	WDT	Watch-Dog Trigger output. Activated in ISP Options
2	POWER_ON	Switch for external Power supply – controlled by Galep SW Active with Logic HIGH Level (3,3V or 5V) Activated in ISP Options
1	GND	Common GND for POWER_ON, WDT, OUT- and IN- signals.
	IN+ IN-	External VCC input, IN- is connected to GND
	OUT+ OUT-	External VCC output. This Vcc is switched by the POWER_ON signal. OUT- is connected to GND

Some of the Galep output pins are connected parallel by the ISP-Adapter. This lowers the Vcc Drop-Down effect caused by Pin-Driver resistors and enables the Galep to support up to 200mA.
In case of these limited Galep4 power supply capabilities, the ISP-Adapter contains an additional power switch control (POWER_ON pin) and power transistors.
The Galep SW is then able to control a target-Systems which require more than 200mA (Enabled by ISP Options: „Adapter Ext. Power ON").
If an external power supply switch is used, the user have to support the IN-Pins with the required Voltage (max. 2A/20V).
If the Target-System requires an other voltage than the Galep does provide (s. ISP Options Menu: „Vcc target Supply"), the external power supply feature have to be used too.
An ISP-Adapter isn't mandatory if a power supply below 50mA is required. An 1:1 connection (s. Tables below) can be used in this case.

ATMEL Devices

Conitec Part No. 210865, Connector position N4.

The pin connections for ISP mode, SPI interface:

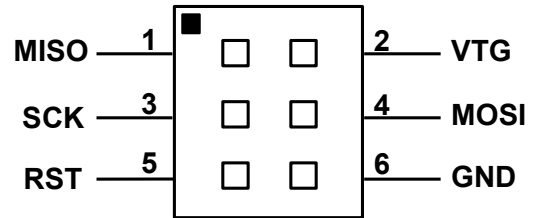| Galep3 Pin No.	Galep4 Pin No.	Galep5 Pin No.	ISP Connector definition by ATMEL	ISP Connector function
21	21	25	1	MISO
20	20	24	2	VTG [1]
22	22	26	3	SCK
19	19	23	4	MOSI
23	23	27	5	RST
30	18	22	6	GND

Fig. 1: ISP connection, connector N4

[1] - Vcc from GALEP to target. Can be connected/disconnected via the Options Dialog.

The pin connections for ISP mode, TPI interface:

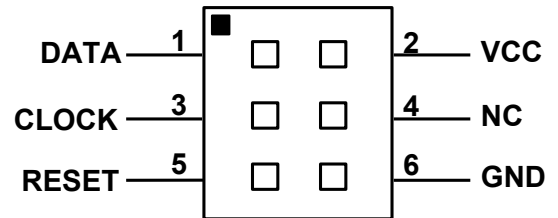| Galep3 Pin No.	Galep4 Pin No.	Galep5 Pin No.	ISP Connector definition by ATMEL	ISP Connector function
21	21	25	1	DATA
20	20	24	2	VCC [1]
22	22	26	3	CLOCK
19	19	23	4	NC
23	23	27	5	RESET
30	18	22	6	GND

Fig. 2: ISP connection, connector N4

[1] - Vcc from GALEP to target. Can be connected/disconnected via the Options Dialog.

Conitec Part No. 210865, Connector position N5.

The pin connections for ISP mode, AT89S/LP microcontrollers :

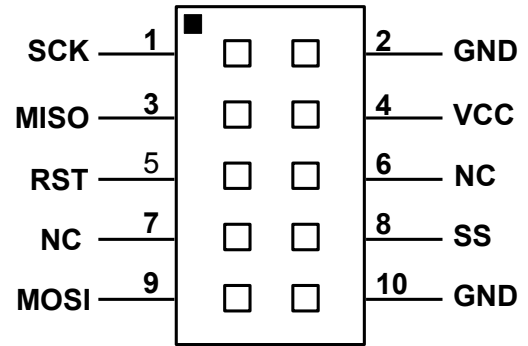| Galep3 Pin No.	Galep4 Pin No.	Galep5 Pin No.	ISP Connector definition by ATMEL	ISP Connector function
21	21	25	1	SCK
20	20	24	2	GND
22	22	26	3	MISO
29	19	23	4	VCC [1]
23	23	27	5	RST
			6	NC
			7	NC
17	17	21	8	SS [2]
25	25	29	9	MOSI
16	16	20	10	GND

Fig. 3: ISP connection, connector N5

[1] - Vcc from GALEP to target. Can be connected/disconnected via the Options Dialog.
[2] - Optional.

The pin connections for ISP mode, AVR microcontrollers :

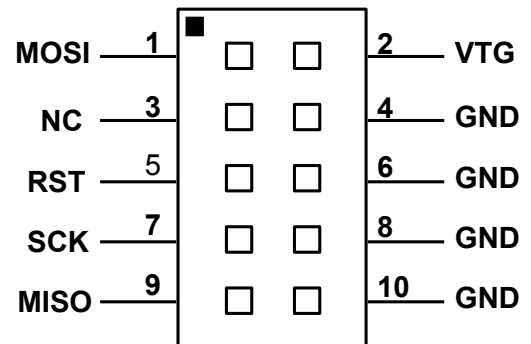| Galep3 Pin No.	Galep4 Pin No.	Galep5 Pin No.	ISP Connector definition by ATMEL	ISP Connector function
21	21	25	1	MOSI
20	20	24	2	VTG [1]
			3	NC
	19	23	4	GND [2]
23	23	27	5	RST
30	18	22	6	GND
24	24	28	7	SCK
	17	21	8	GND [2]
25	25	29	9	MISO
16	16	20	10	GND

Fig. 4: ISP connection, connector N5

[1] - Vcc from GALEP to target. Can be connected/disconnected via the Options Dialog.
[2] - Not available on GALEP-3.

Silicon Laboratories Devices

Conitec Part No. 210865, Connector position N5.

The pin connections for ISP mode:

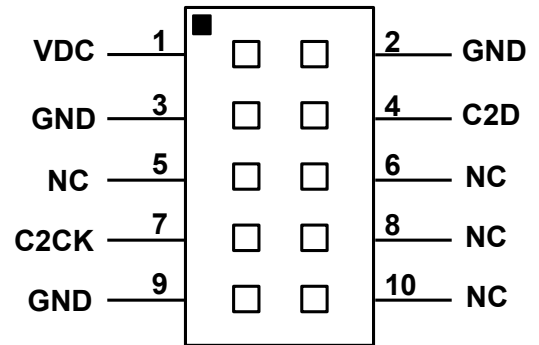| Galep4 Pin No.	Galep5 Pin No.	ISP Connector definition by **Silicon Laboratories**	ISP Connector function
21	25	1	VDC
20	24	2	GND
22	26	3	GND
19	23	4	C2D
		5	Not Connected
		6	Not Connected
24	28	7	C2CK
		8	Not Connected
25	29	9	GND
		10	Not Connected

Fig. 5: ISP connection, connector N5

EM Microelectronic-Marin SA Devices.

Conitec Part No. 210865, Connector position N5.

EM4176,EM4276,EM4376,EM6869

Galep5 Pin No.	ISP Connector Pin No.	ISP Connector function
25	1	VBAT
24	2	TEST_IN
	3	Not Connected
	4	Not Connected
	5	Not Connected
22	6	SDIO
28	7	VSS
21	8	SCLK
29	9	VSS
	10	Not Connected
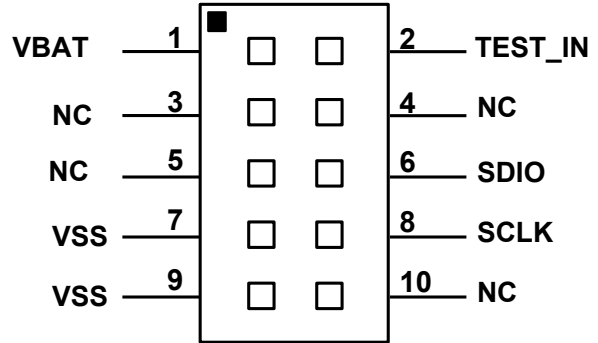
Fig. 6: ISP connection, connector N5

EM6819

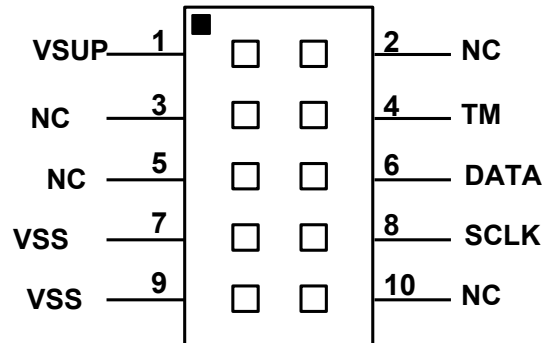| Galep5 Pin No.	ISP Connector Pin No.	ISP Connector function
25	1	VSUP
	2	Not Connected
	3	Not Connected
23	4	TM
	5	Not Connected
22	6	DATA / PB7
28	7	VSS
21	8	SCLK / BP6
29	9	VSS
	10	Not Connected

Fig. 7: ISP connection, connector N5

JTAG Interface selection in device menu

The pin connections for JTAG mode („JTAG" selection in Galep4 device list):
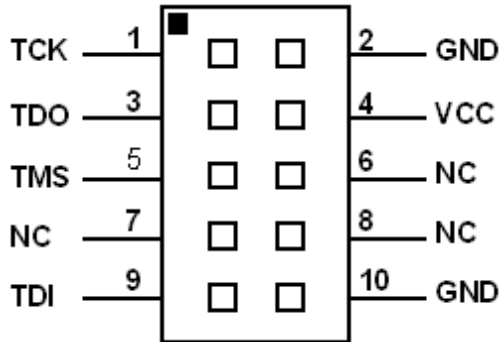
Fig. 8: JTAG connection, connector N5

Galep4 Pin No.	ISP Connector function	ATMEL ISP Connector definition or Galep ISP-Adapter Part No. 210865 Connector N5(10pol.) Pin No.:	Note
16	GND	10	
17	NC	8	
18	NC	6	
19	NC (VCC)	4	Some programming interfaces require a power supply by the target. This pin is not connected to Galep power supply and not supported by Galep.
20	GND	2	
21	TCK	1	
22	TDO	3	
23	TMS	5	
24	NC	7	
25	TDI	9	

Fujitsu Devices : MB95Fxxx

Conitec Part No. 210865, Connector position N5.

The pin connections for ISP (ASYNC) mode:

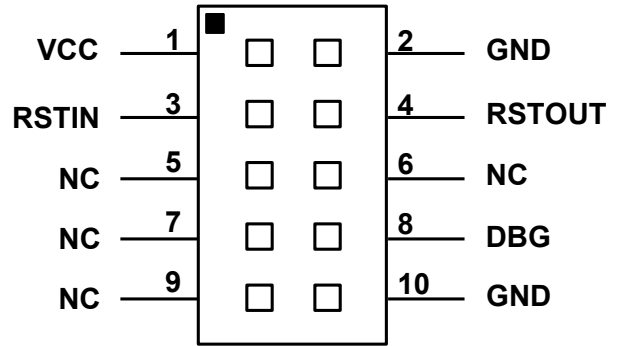| Galep5 Pin No.	ISP Connector	ISP Connector function
25	1	VCC
24	2	GND
26	3	RSTIN [1]
23	4	RSTOUT
	5	Not Connected
	6	Not Connected
	7	Not Connected
21	8	DBG
	9	Not Connected
	10	Not Connected

Fig. 9: ISP connection, connector N5

[1] - This connection is need only for MB95F2xx.

Fuitsu Devices

Conitec Part No. 210865, Connector position N5.

See ISP Options for selecting the ISP functions.

Activate „Vcc by Galep" in ISP Options menu if no other power source is available.

Caution: Deactivate „VCC by Galep" in ISP Options menu when Target don't use the Power supply by Galep4– Target or Galep device damage is possible.

„SYNC" adapter selected in device menu

ISP cable length max. 20cm. A cable length of up to 60cm can be used if 220Ohm resistors are added in serial of P01, P00, SCK, SIN, SOT, MD0 and MD2 wire.
Selection of cable length >20cm and if 220Ohm have to be used, depends on target layout and have to be selected by the user.
Check FUJITSU application notes AN-000004-11 for more informations.

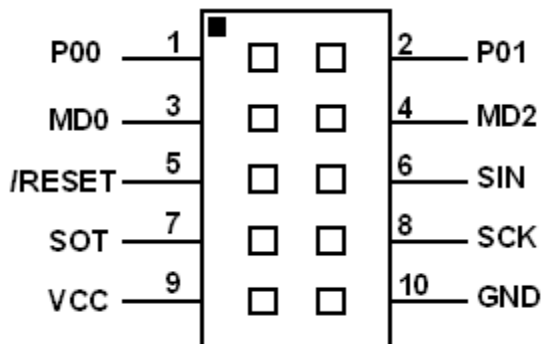The pin connections for synchronous mode („SYNC" selection in Galep4 device list):

Fig. 10: Fujitsu SYNC connection, connector N5

Galep4 Pin No.	ISP Connector function	ISP Connector definition by Fujitsu or Galep ISP-Adapter Part No. 210865 Connector N5(10pol.) or N6(14pol.) Pin No.:	Note
16	GND	10	
17	SCK	8	
18	SIN	6	
19	MD2	4	
20	P01 (P31, P81)	2	This pin is used as a BUSY signal for Galep SW when MCU kernel is running. It Should be connected to Galep for best performance. Otherwise fixed delay times are assumed by Galep SW. Don't connect this pin without pull-up or pull-down to VCC or GND. This could damage the device or programmer during SYNC mode.
21	P00 (P30, P80)	1	
22	MD0	3	
23	/RESET	5	
24	SOT	7	
25	VCC	9	

See Fujitsu Application Notes shows how to connect the 10 pins to your target system.

„ASYNC" adapter selected in device menu

In asynchronous mode you need a PC RS232 Port only (signals RxD and TxD at least). A Galep4 is mandatory to be connected as a dongle.

The pin connections for asynchronous mode („ASYNC" selection in Galep4 device list):

PC RS232, DB-9 PIN No.:	Connector function	Note
1	NC	
2	RxD	
3	TxD	
4	DTR	Used for Reset signal or Mode Control s. „RTS reset, DTR mode selection"
5	GND	
6	DTR	Connected to DTR
7	RTS	Used for Reset signal or Mode Control s. „RTS reset, DTR mode selection"
8	CTS	Connected to RTS
9	NC	

If „ASYNC" is being selected, the ISP-Adapter (Part No. 210865) is mandatory only, when GALEP have to provide the target power supply (200mA max.) or the Galep have to generate a Watch-Dog trigger signal.

If a target clock sources of 5MHz, 10MHz or 20MHz is used, some targets require to set P00 or P30 or P80 to logic HIGH.

For more details check Fujitsu Application Notes how to connect a RS232 to your target system.

Motorola Devices

Conitec Part No. 210865, Connector position N4.

BDM Interface selection in device menu

The pin connections for BDM mode („BDM" selection in Galep4 device list):
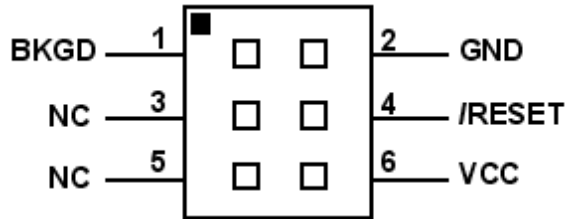
Fig. 11: Motorola BDM connection, N4

Galep4 Pin No.	Galep5 Pin No.	ISP Connector function	ISP Connector definition by Motorola or Galep ISP-Adapter Part No. 210865 Connector N4(6pol.) Pin No.:
18	22	VCC	6
19	23	/RESET	4
20	24	GND	2
21	25	BKGD	1
22	26	NC	3
23	27	NC	5

MICROCHIP Devices

Conitec Part No. 210865, Connector position N4.

Pin connections for PIC Microcontrollers.

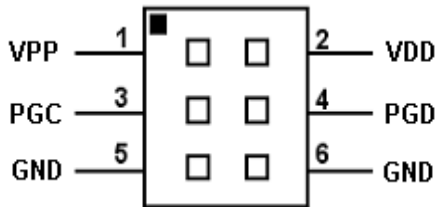*Fig. 12: Microchip PIC connections, N4*

Galep4 Pin No.	Galep5 Pin No.	ISP Connector function	Galep ISP-Adapter Part No. 210865 Connector N4(6pol.) Pin No.:
8,18,30	12,22,34	GND	6
29	33	PGD	4
10,20,28	14,24,32	VDD	2
13,21,31	17,25,35	VPP	1
22	26	PGC	3
11,23,33	15,27,37	GND	5

ISP Options

Common options for all devices using the ISP-Adapter. **Please note:** Select the ISP version – not the socket version – of the device!

Vcc by Galep

This switch enables the power supply by Galep for a target system. The voltage depends on the selected device and is visible below.
This switch can also be activated when a COM port is used for programming. This switch is disabled if „Adapter Ext. Power ON" is selected.

Adapter Ext. Power ON

This switch enables a control pin for external power supply switching.
If the signal is raised to HIGH level during start of device initialization, a 100ms delay is added to respect external Vcc raise time.
Activating this switch disables the „Vcc by Galep" switch.
If not enabled the output will be HIGH-Z.

Reset by Galep

This switch enables the reset signal for the target system.
The duration of active phase and active polarity can be selected.

Depending on the ISP-SW algorithm, a reset will be activated by a SW-command too (transmitted via the communication lines).
If mandatory by the device, this signal is fixed to active.

Depending of the selected connection, Reset is active only at ISP-Adapter or at RS232 connector lines.

Reset enable/Pulse time

Define the Reset period length.

Reset enable/Polarity

This button is used to respect signal inverter on the target system.

WDT Trigger by Galep

Activates a Watch-Dog trigger signal during an action is running.
If enabled, the duration of the trigger periods can be selected.
This signal is output by the ISP-Adapter.
If not enabled the output will be HIGH-Z.
This switch is also active when a COM port is used for programming.

Default Values

Reset all values.

FUJITSU (ASYNC/SYNC)

If a device is being selected with „SYNC" or „ASYNC", this options menu is visible.

„SYNC" in device list means a synchronous connection (fast connection with SDIN, SDOUT and SCLK signals).
The ISP-Adapter is mandatory in this case.

„ASYNC" in device list means an asynchronous connection.
A PC COM Port have to be used.

The target system have to fulfil the requirements for synchron or asynchron programming (see manufacturers design notes).

If „ASYNC" is being selected, an ISP-Adapter is only mandatory when GALEP have to provide the target power supply or have to generate a Watch-Dog trigger signal.

ASYNC Options
If a device with „ASYNC" adapter is selected the following options are visible too:

COMPort
One of PC COM ports COM1 ..COM3 can be selected for connection.

Baud Rate
Active when RS232 communication speed of the Target system can be selected.

The signals RTS and DTR are used for Reset and Control functions.

RTS reset, DTR mode selection
RTS signal on selected COM port is toggled at reset.
DTR signal is used for mode selection.

DTR reset, RTS mode selection
DTR signal on selected COM port is toggled at reset.
RTS signal is used for mode selection.

CPU mode Polarity
Select polarity of CPU mode when active.
This button is used to respect signal inverter on the target system**.**

MCU clock
Select target MCU Crystal frequency to compute the correct Baudrate.

Default Values
Reset all values.

SYNC Options

If a device with „SYNC" adapter is selected the following option is visible too:

Sync Speed
Selects Bit I/O clock from 125kHz up to 1MHz. Respect Sync clock max. 1/8 of crystal frequency.

MOTOROLA (BDM)

BDM COM Options

Don't enable the „Vcc by Galep" switch. VCC in BDM interface is defined to support the Programming interface and not to be supported by the interface.
In case of limited Galep FPGA clock source generation, the devices are initialised in active background mode during Reset.
Check the Device documentation if any of the values below are changed.

MCU Bus Clock
Select MCU bus Clock (½ of Crystal frequency) to process a new FCDIV value for the internal MCU Programming clock (150kHz -200kHz required).

FCDIV_Register
Hex Value for FCDIV register changed if MCU Bus clock is changed or by user edit.

Alternate Clock
Select value of communication alternate clock of BDM interface

Enable ACK Signal
Enables Acknowledge signal for communication.

Select alternate Frequency
The value selected in „**Alternate Clock"** is used as a base frequency for communication.

Adapter Schematic

	N7		N8		N9
	4 PIN4		6 GND		6 GND
	3 PIN3		5 EXTRA5		5 POW_ON
	2 PIN2		4 EXTRA4		4 DRAIN_N
	1 PIN1		3 EXTRA3		3 POW_IN
	JUM_4X1		2 EXTRA2		2 POW_OUT
			1 EXTRA1		1 AUX
			JUM_6X1		JUM_6X1

N1

GND	1		40	EXTRA5
POW_ON	2		39	EXTRA4
POW_IN	3		38	EXTRA3
POW_OUT	4		37	EXTRA2
AUX	5		36	EXTRA1
PIN10	6		35	PIN9
PIN8	7		34	PIN7
PIN6	8		33	PIN5
PIN4	9		32	PIN3
PIN2	10		31	PIN1
PIN5	11		30	PIN6
PIN3	12		29	PIN4
PIN1	13		28	PIN2
PIN14	14		27	PIN13
PIN12	15		26	PIN11
PIN10	16		25	PIN9
PIN8	17		24	PIN7
PIN6	18		23	PIN5
PIN4	19		22	PIN3
PIN2	20		21	PIN1

WANNE14

PIN1	1	2	PIN2
PIN3	3	4	PIN4
PIN5	5	6	PIN6
PIN7	7	8	PIN8
PIN9	9	10	PIN10
PIN11	11	12	PIN12
PIN13	13	14	PIN14

N6

WANNE10

PIN1	1	2	PIN2
PIN3	3	4	PIN4
PIN5	5	6	PIN6
PIN7	7	8	PIN8
PIN9	9	10	PIN10

N5

WANNE6

PIN1	1	2	PIN2
PIN3	3	4	PIN4
PIN5	5	6	PIN6

N4

N2-1 POW_IN   POW_OUT N3-1
R3 NDT456P T1
R4 DRAIN_N
POW_ON R2   T2 BSS138
R1
N2-2 GND   GND N3-2
W237-02P   W237-02P

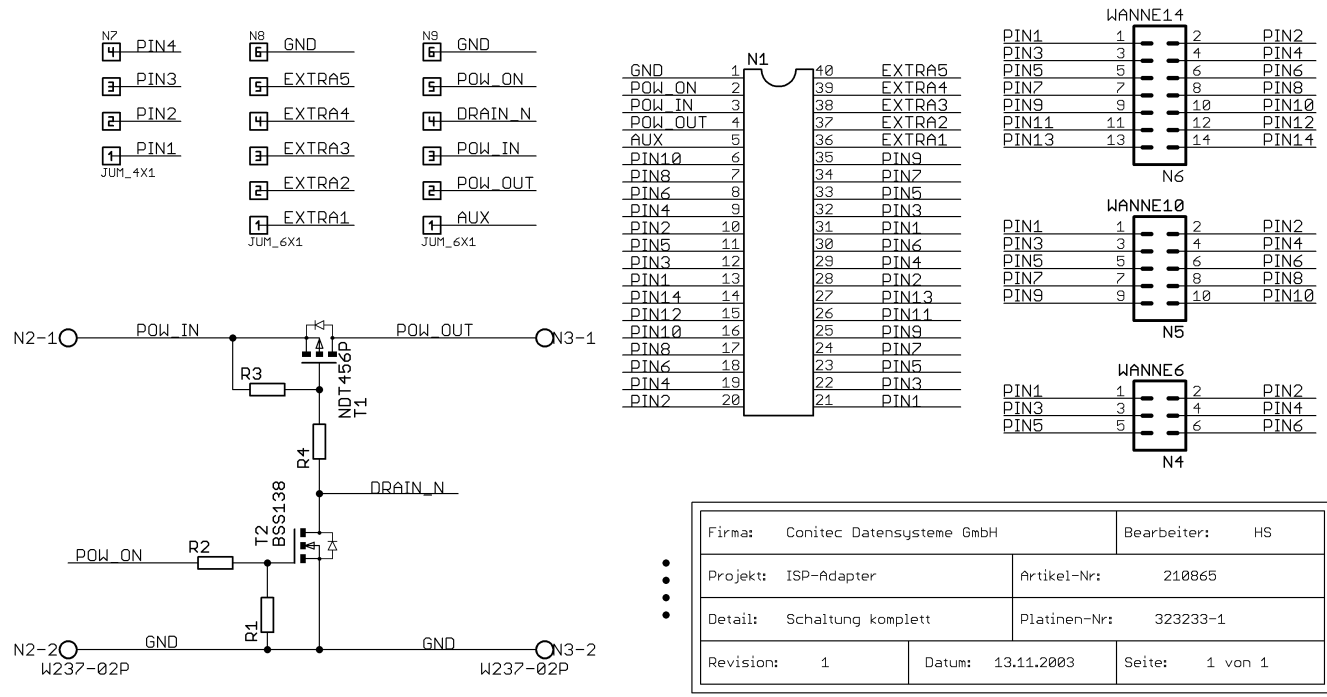| Firma:	Conitec Datensysteme GmbH		Bearbeiter:	HS
Projekt:	ISP-Adapter	Artikel-Nr:	210865	
Detail:	Schaltung komplett	Platinen-Nr:	323233-1	
Revision:	1	Datum: 13.11.2003	Seite:	1 von 1

Fig. 13: Schematic of ISP adapter 210865