-- English --

Adapter for MCU's, which are in system programmable.

-- Deutsch --

Adapter für MCU's, die im System programmiert werden können.
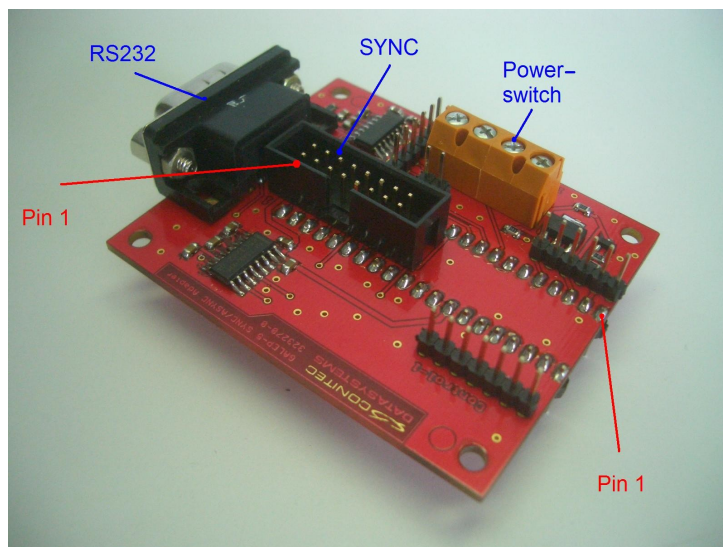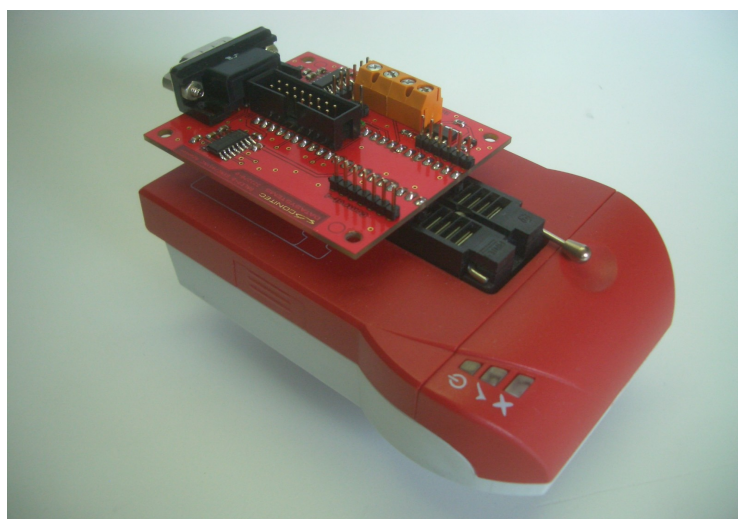

Illustration 1: ISP-ASYNC/SYNC-adapter 210915

Illustration 2: Galep-5 with ISP-ASYNC/SYNC adapter 210915

ISP ASYNC/SYNC adapter

Conitec Part No. 210915

(Valid for SW Release version > 1.17.57)

Description:
This adapter is designed to support primarily FUJITSU ISP-programming connections and developer kits.
 Galep5 isn't able to control a PCs RS232 port.
In this case the Galep5 provides the required set of signals on the DIP48 connection. The signal type is TTL depending on the selected device power supply level.
If additional level shifter are required, the adapter 210915 is suggested to replace PC RS232 UART port.
Connecting a RS232 port with Rx, Tx, RTS, CTS, DTR and DSR signals with Galep5 is possible with this adapter.
A 16pol. multi-pin connector is added for FUJITSU ISP-connections, which require only TTL level signals.
An external power supply switch permits the ON/OFF control of ISP-targets which require more than 200mA power supply.

Additional pins are connected for controlling programming machines.

Installation:
Place the 40pin ISP-adapter on the bottom 40 pins of the Galep5 (pins 5..44) with pointing the UART connector to the Galep5 supply ports(see Illustration 2 above).

For standard FUJITSU ISP-SYNC connections(10pol.) use the 16pol. to 10pol. ribbon cable plugged on the 16Pol connector.

Parts provided:
-ISP-Adapter board 210915
-RS232 cable, female to male, 2m length, 1:1 modem cable
-Ribbon cable with 16pol. to 10pol. connectors, 20cm length
-Ribbon cable with 16pol. to 16pol. connectors, 20cm length

Hints:
For more details how to design and connect a RS232 ISP-port or a SYNC-connection on your target system, check Fujitsu application notes or FUJITSU developer kit schematics.

All devices listed in device list are tested with the related FUJITSU developer kit.

Use either SYNC or ASYNC- type connection.

Revision History

Version/Date	Note
1.0 / 28.08.2007	First document release
1.1 / 12.02.2008	„Active control pins" added
1.2 / 18.02.2008	ICT added / new schematic
1.3 / 15.09.2008	Minor text changes

FUJITSU devices ASYNC mode connection

Conitec Part No. 210915, use DB-9 connector

„ASYNC" adapter selected in Galep5 device menu

If „ASYNC" is being selected while using a Galep5 and the target uses an level shifter, this ISP adapter is required.
In asynchronous mode you need logic level converters for RS232 compatibility (signals RxD and TxD at least).

If a target clock source of 5MHz, 10MHz or 20MHz is used, some target devices require to set P00 or P30 or P80 to logic HIGH(mode control pin). This pin can be controlled by RS232 too (alternate output to reset Pin, RTS or DTR)
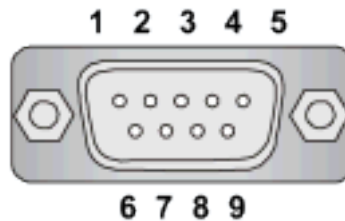
RS232 male connector

Abbildung 3: RS232 male connector

PC RS232, DB-9 male PIN No.:	Connector function	Note	G5
1	DCD	Data Carrier Detect (DCD)	Not connected
2	RxD	Receive (RxD)	Mandatory for target connection
3	TxD	Transmit (TxD)	Mandatory for target connection
4	DTR		Used for Reset signal or mode control s. „RTS reset, DTR mode selection"
5	GND	Signal Ground	
6	DSR	Data Set Ready (DSR)	Connected but not used in G5 ASYNC mode
7	RTS	Request To Send (RTS)	Used for Reset signal or mode control s. „RTS reset, DTR mode selection"
8	CTS	Clear To Send (CTS)	Connected but not used in G5 ASYNC mode
9	RI	Ring Indicator (RI)	Not connected

Table 1:The pin connections for asynchronous mode RS232 connector

FUJITSU devices SYNC mode connection

Conitec Part No. 210915, use 16pol. Pin connector with ribbon cable 16pol to 10pol

„SYNC" adapter is selected in device menu.

See "ISP Options" for selecting the ISP functions.

Activate „Vcc by Galep" in "ISP Options" menu if no other power source is available and VCC pin 9
is connected.
Caution: Deactivate „VCC by Galep" in "ISP Options" menu when Target don't use the Power supply by Galep5
– Target or Galep device damage is possible.

The ISP cable length must be below 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.
The selection of cable length above 20cm and if 220Ohm have to be used, depends on the target layout and have to be selected by the user.
Check FUJITSU application notes AN-000004-11 for more informations.

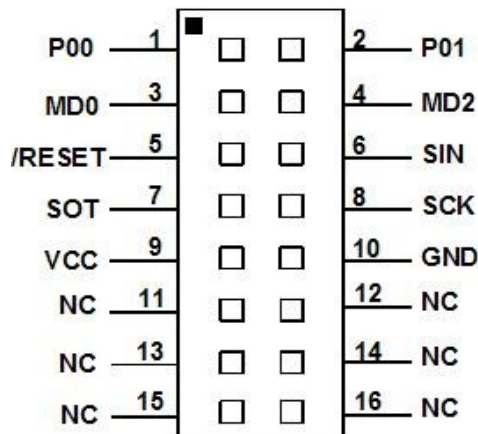See Fujitsu Application Notes shows how to connect the pins 1..10 to your target system.

Abbildung 4: SYNC connector of ISP-adapter

Galep4 DIL40 Pin No.	Galep5 DIL48 Pin No.	ISP Connector function	Galep ISP adapter Part No. 210915 16pol. connector Pin No.:	ISP Connector definition by Fujitsu 10pol. connector Pin No.:	Note
16	20	GND	10	10	Signals ground
17	21	SCK	8	8	Sync clock output
18	22	SIN	6	6	Data output to target device
19	23	MD2	4	4	Control pin for enabling programming in boot mode
20	24	P01 (P31, P81)	2	2	This pin is used as a BUSY or acknowledge 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	25	P00 (P30, P80)	1	1	For many devices this is the control pin for boot up programming mode selection in SYNC mode.
22	26	MD0	3	3	Control pin for enabling programming in boot mode
23	27	/RESET	5	5	Target Reset control
24	28	SOT	7	7	Data input from target device
25	29	VCC	9	9	Target power supply if enabled (max. 200mA@5V)
14..16	17..19		12, 14, 16		Not used, reserved for future use
26..28	30..32		11, 13, 15		Not used, reserved for future use

Table 2: Pin description for SYNC-mode adapter

Power supply switch connector

Galep4 DIL40 Pin No.	Galep5 DIL48 Pin No.	ISP Connector function	Description
40	44	WDT	Toggle/reset Watch-Dog of target, if required. TTL square wave output. Period length is defined in Options menu. Activated in "ISP Options"
2	6	POWER_ON	ON/OFF control for external Power supply switch The IN+ to OUT+ connection is controlled by Galep SW. Active with Logic HIGH Level (3,3V or 5V depends on device supply) Activated in "ISP Options"
1	5	GND (OUT-, IN-)	Common GND for POWER_ON, WDT, OUT- and IN- signals.
3	7	IN+	Connector „N4" External VCC input, This pin is connected to Galep for test purposes only
4	8	OUT+	Connector „N5" External VCC output. This Vcc is switched by the POWER_ON signal. This pin is connected to Galep for test purposes only

Table 3: External power supply connection

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 and Galep5 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 in SYNC-mode can be used in this case.

ISP Options
Common options for all devices using the ISP-Adapter.

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 the active state.

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).
„ASYNC" in device list means an asynchronous connection.

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

When using a Galep5 in „ASYNC" mode, the PC-com port can not be used for device communication.
In this case the Galep5 provides the required ASYNC set of signals on the DIP48 connection.
Connecting directly to the serial pins of the processor eliminates the speed-limiting use of an RS-232 transceiver
If you need an additional level shifter, the adapter 210915 is suggested to replace PC RS232 UART port.
DB9 connector must be used in this case.

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

COMPort
Galep4: One of PC COM ports COM1 ..COM3 can be selected for connection.
Galep-5: No com port selection required. Only the port based on ISP-adapter 210915 can be used
232- uses DB9 connector with tranceiver device.
TTL- uses 10POL SYNC connector with TTL signal type, dependig on the target Vcc level .

Baud Rate
Active when RS232 communication speed of the target system can be selected.
Achievable baud-rates for an ICT based system are > 2Mbps.

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 (SYNC or ASYNC 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 2MHz.
Some devices accept a sync clock of max. 1/8 of crystal frequency (check device manuals for relation of crystal frequency to sync clock speed).

Additional ISP Configuration for ICT control

The option „**Active control pins**" is added for some devices to support simple ICT(In Circuit Tester program control) functions.
This option enables a programming loop controlled by adapter pins. The result and status is reported via pins too.
Only when the „Programm" action is activated the ICT related pins are active.

When the loop is ready for next start or break the text "Control is waiting" is assigned.
After pull down the Start pin „Action is running" is assigned.
After pull down the Break pin "Control break" is assigned.

Connector „Control-1" pin functions on Galep5 SYNC/ASYNC-Adapter 210915

| Adapter Connector 1 PIN No.:	Galep5 DIP48 PIN No.:	Function	Note
7	38	Break / Input	Input User can break the Programming loop when dropped to LOW Connected with a pullup to +5V
6	40	Finish	Output / 5V Will be set HIGH if the complete programming action has finished. Will be set LOW when Start is pulled to LOW.
5	41	Result	Output / 5V Will be set HIGH if any error occurs. Otherwise it will be held LOW. Will be set LOW when Start is pulled to LOW.
4	42	Ready	Output / 5V Will be set to HIGH if the Galep5 is prepared and ready for next Start signal drop. Will be set LOW when Start is pulled to LOW.
3	43	Start	Input User can start the next programming when dropped to LOW. Connected with a pullup to +5V
2	44	NC	
1	5	GND	Shared GND
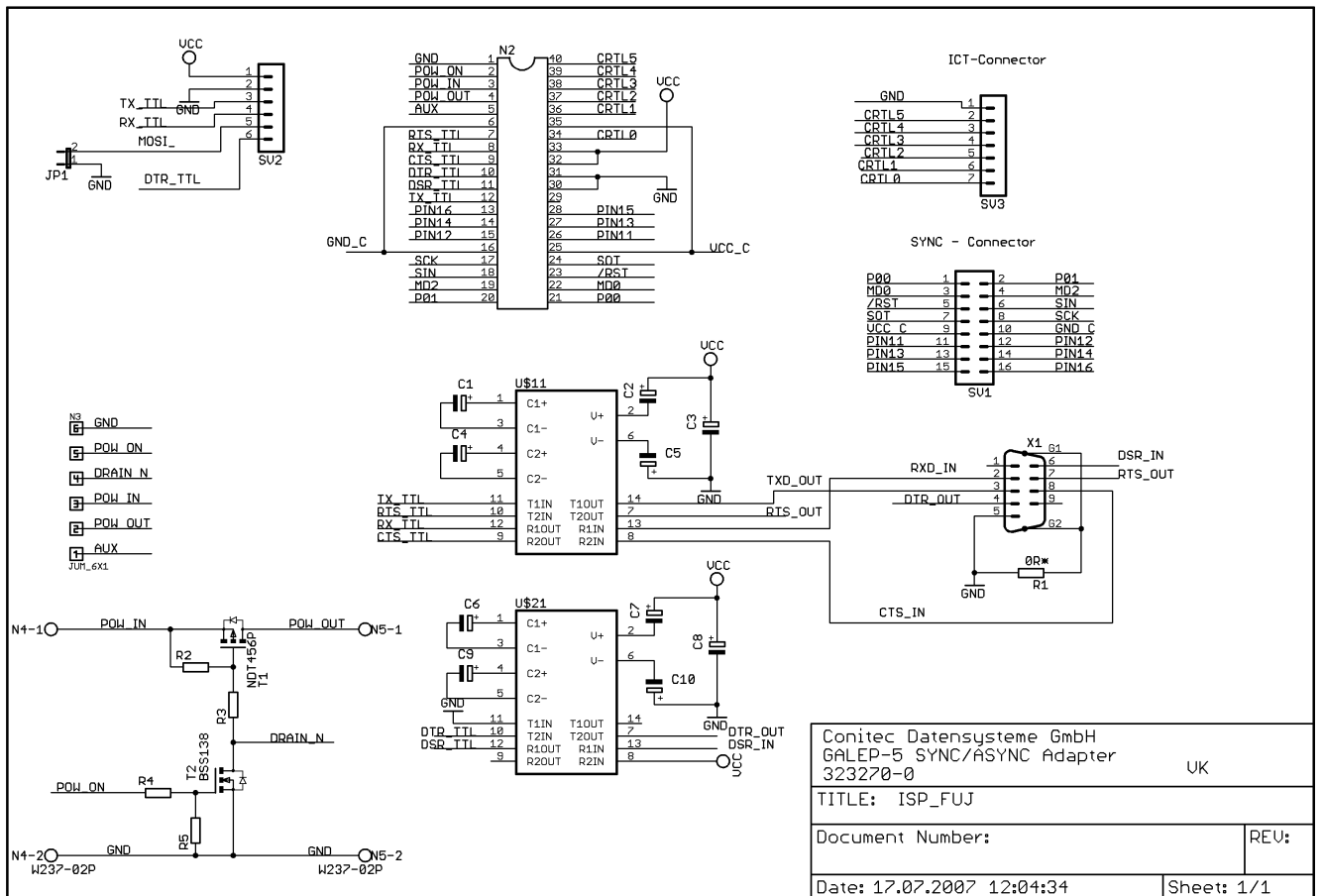
Abbildung 5: Schematic of ISP-ASYNC/SYNC adapter 210915