

SPARKER TCI-P4

SPARKER TCI-P4 is an inductive ignition unit for road motorcycle. The ignition unit can be set by a computer PC with a program TCIP4.EXE. Advance (time of ignition) can be set as a function of revolution or as a function of revolution and TPS (throttle position sensor). Ignition contains outputs for tachometer, fuel pump relay, and servo controller. It contains also two inputs for blocking of ignition and one for servo controller. It is by the time of programming connected with computer PC by serial port (COM). The program TCIP4.EXE is included to ignition unit.

HARDWARE

Pick up system.

Ignition can have maximal four channels. Standard version has two channels (four-cylinder engine). Ignition can be programmed for many pickup systems. Most of them can be choose directly from list in program TCIP4.EXE others can be set by special procedure (also by program TCIP4.EXE).

Supply voltage +12 V input.

Supply voltage must be within 8 – 18 voltage range. In this range the unit is able to provide optimal control of all the processes. Supply voltage is connected by positive outlet to +12 V (13) and by negative outlet to GND (14).

Throttle position sensor TPS input.

An input is ready for standard TPS sensors used on motorbikes. It is designed for voltage range 0 - 5 V. Sensor settings for 0 % and 100 % is set by TCIP4.EXE software.

TPS is powered by referential voltage + 5 V (17) and SENSE GND (16). Sensor outlet will be connected to connector (6).

Crankshaft position sensor CKPS input.

An input is ready for standard pickup sensors used on motorbikes as CKPS.

One outlet of the CKPS should be connected to connector (9) and the other one should be connected to SENSE GND (16). See following the chart. For system with two pick-ups should be one outlet of the second pick-up connected to connector (20) and the other one should be connected to SENSE GND (16). See following the chart.

Blocking input.

One outlet of blocking switch (for example side stand switch) should be connected to connector (8) and other one should be connected to SENSE GND (14) or GND (16). If the blocking switch is active the ignition is blocked. Opposite polarity of blocking input can be set by software TCIP4.EXE.

Induction coils IC 1, IC 2, IC 3, IC 4 outputs

One outlet of induction coil of cylinder 1, 4 should be connected to key switched + 12 V and the other one should be connected to corresponding connector IC 1, 4 (1). One outlet of induction coil of cylinder 2, 3 should be connected to key switched + 12 V and the other one should be connected to corresponding connector IC 2, 3 (10).

Excitation (dwell time) of induction coil can be set to short or long by software TCIP4.EXE. Short dwell time is for induction coil with primary coil resistance less than 2 Ohm. If long time is used for that one coil, coil can be destroyed. If it is used short time for coil that desire long dwell time, the energy of spark could be small especially in high rpm.

Revolution indicator - TACHO output.

The revolution indicator output is compatible with most of board devices used on motorbikes. Pulse number for one revolution and corrections is set within TCIP4.EXE software. TACHO output should be connected to connector (15).

FUEL PUMP RELAY output.

Fuel relay is switch on while the motor is running, for about 4 s after the unit is switched on and for about 4 sec. after motor has stopped. One fuel pump relay outlet should be connected to connector (3) and the other one should be connected to key switched + 12V. Connect the switched fuel pump relay circuit following the diagram.

Outputs and input for SERVO.

Outputs and input for servo are compatible with most of servo used on motorbikes (e.g.. Yamaha EXUP). Ignition with servo is only done on demand.

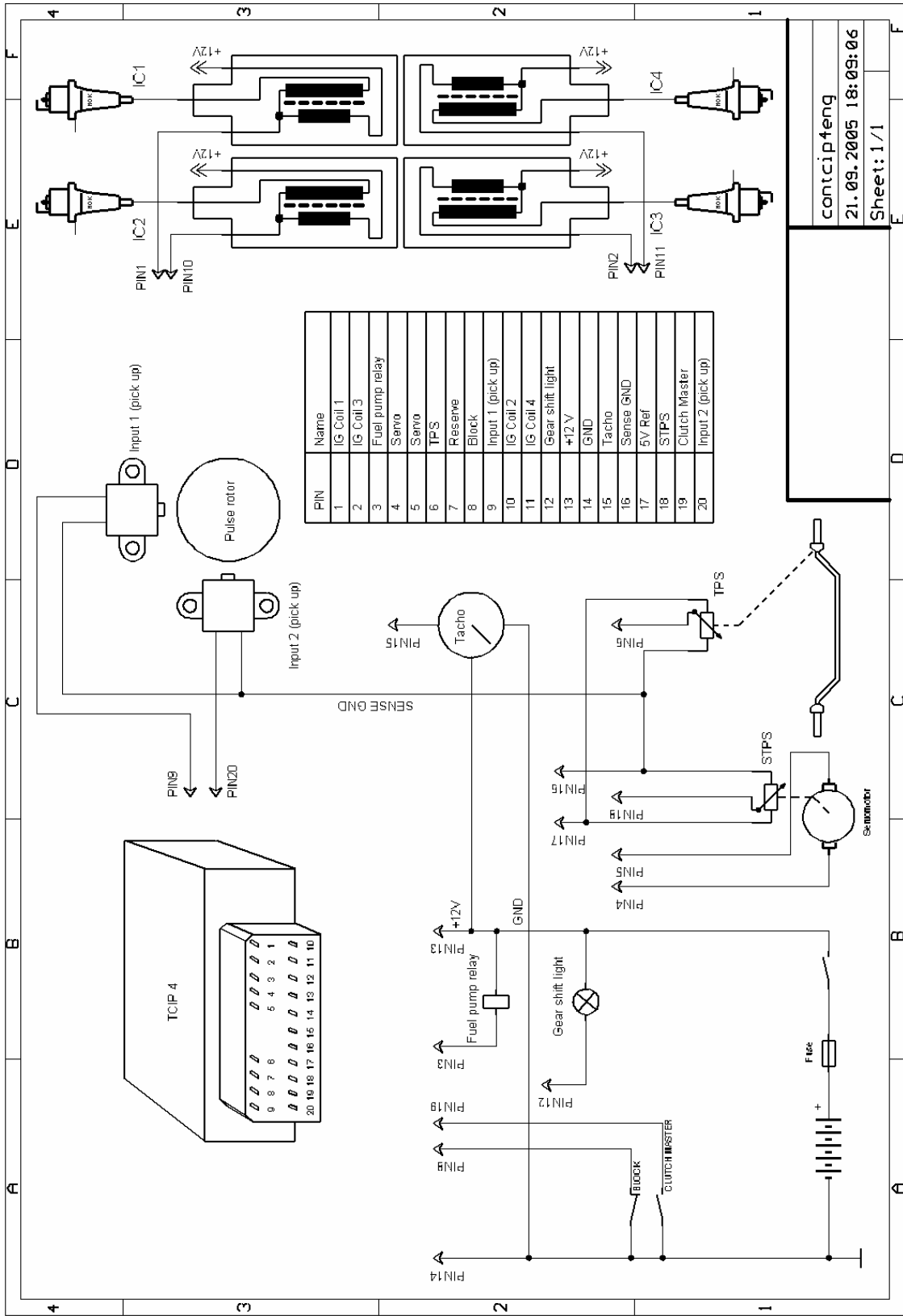
Output for GEAR SHIFT LIGHT

Maximal current is 5 A (lamp max. 50 W). Revolution for gearshift light is set by software TCIP4.EXE. One outlet of gearshift light should be connected to connector (12) and other to switched +12 V.

CLUTCH MASTER input.

One outlet of CLUTCH MASTER switch should be connected to connector (19) and the other one should be connected to SENSE GND (16) or GND (14). If CLUTCH MASTER switch is activated, the unit blocks ignition for a defined period of time. This provides for higher gearshift without clutch and gas shut-off, thus minimizing the time losses during gear shifting. Blocking time can be adjusted within TCIP4.EXE software. Reverse polarity of the CLUTCH MASTER switch can be configured within TCIP4.EXE software.

WIRE COLOUR	pin no. in connector	NAME	DESCRIPTION
orange	1	IC 1	inductive coil 1,4
	2	IC 3	not connected in standard
violet	3	FUEL PUMPE RELAY	inductive coil 2,3
green	4	M	output for servomotor
green	5	M	output for servomotor
grey	6	TPS	throttle position sensor
	7		not connected
black	8	BLOCK	blocking input
yellow	9	CKPS (1)	input for pick-up (1)
white	10	IC 2	inductive coil 2,3
	11	IC 4	not connected in standard
	12	GEAR SHIFT LIGHT	output for gear shift light
red	13	+ 12 V	supply 12 V
blue	14	GND	ground
green/yellow	15	TACHO	output for tachometer
blue	16	SENSE GND	ground for sensors
white/red	17	+ 5 V	supply for sensors
white/blue	18	STPS	servo position sensor
	19	CLUTCH MASTER	input for gear shift sensor
brown	20	CKPS (2)	input for pick-up (2)



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SOFTWARE TCIP4.EXE

Pull down menus

File – includes items	New	- default settings
	Open	- opens data file
	Save	- saves data file
	Print	- prints the current settings
	Print all	- prints the current settings all tab sheets
	Exit	- exits the program

Clicking **New** results in default settings of all parameters. They value for four-stroke engine without TPS.

Port – includes items **Com1** to **Com10** - selection of communication line
For PC without COM (USB only) apply adapter USB/RS232.

Device – includes items	Read	- reads data from the unit
	Verify	- compares data in PC with data in the unit
	Program	- sends data to the unit and conducts verification

Tools – include items of collective settings

Language – language settings: **English, German, French and Czech**

Help – includes items	Help	- opens assembly guide (this file)
	About the program	- data on the software (version, date)

Icons menus



- default settings

Warning!!! Clicking this icon results in automatic default settings of all parameters



- opens data file



- saves data file



- prints the current settings



- see pull down menu **Device**

Tab sheet Miscellaneous

Limiter	- sets revolution of classic starting limiter
Clutch master time	- sets ignition switch off period during gear shift
Clutch master pause	- sets time of insensibility after gear shift
Gearshift light	- sets revolution of gearshift light
Revolutions without ignition	- sets number of starting revolution without ignition
Excitation long	- sets long excitation of induction coils
Programming after a change	- automatic programming settings (after every change)
No reading	- reading is not allowed (after programming with this option data cannot be retrieved from the unit)

Inputs for neutral and side stand – Logic of inputs is set for neutral and side stand. The ignition is not blocked if at least one input is grounded.

Input 1	- choice of input 1 function
Input 2	- choice of input 2 function

TPS - limit TPS voltage values can be set here [mV]



- measures and sets 0% TPS (supply on, unit connected with PC, no gas)

Set TPS 100

- measures and sets 100% TPS (supply on, unit connected with PC, full gas)

File: - full path of using file

Tab sheet Motorcycle

- Choice of pickup system** - Choice of pickup system for certain motorcycle
- Pulses per revolution** - Setting of tacho output
- Correction** - Correction of tacho in %

Tab sheet Advance map

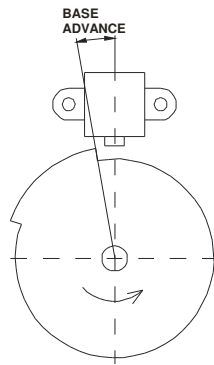
Advance map

TP map includes 100 adjustable advance options (in relation revolution and throttle position). Collective setting of the whole column is possible using the arrows under columns. Collective adjustment of the whole map can be done by collective change tool (+ and – buttons with selection **All**)

When the motor is running and PC connected with the unit current segment in the fuel map is highlighted. Use of collective change tool + and – button without selection **All** - just the current segment will be changed.

TPS - option advance map/advance curve

Base advance - setting of base advance



Tab sheet Servo

Servo allowed - software activation of servo controller

10 adjustable options for revolution/required voltage of servo position sensor

Collective adjustment of the whole servo curve can be done by collective change tool (+ and – buttons with selection **All**)

When the motor is running current segment is highlighted in the servo curve. Use of collective change tool + and – button without selection **All** - just the current segment will be changed.

Hysteresis – fineness of servo driver steps can be set here

!!!Warning!!! - in case you set too low value there is a risk of servo oscillation

Monitor

Monitor is located on the right and lower side of the screen – sensor values and motor operational characteristics can be observed here. Should there be **No connection with PC** prompt displayed in the upper right corner, the unit is not connected.

- RPM** - motor revolution [1/min]
- TP** - Throttle position [%]
- Advance** - Ignition advance [°]
- Pick up 1** - display whether pick up 1 is running or stopped
- Pick up 2** - display whether pick up 2 is running or stopped
- U** - supply voltage [V]

Servo required

Servo measured

Blocking

Number of programming

- Required value of servo position sensor
- Measured value of servo position sensor
- Blocking activation signal
- Number of times the unit has been programmed