SPARKER TCI-P4 version 75

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 (7, 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 (7, 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 (7, 16). See following the chart.

Switching inputs 1 and 2.
Unit has two multiuse switching inputs. These inputs can initialize some function (for example KILL switch, CLUTCH MASTER, blocking for side stand switch ...) One outlet of first switch should be connected to connector (8) and other one should be connected to SENSE GND (7, 16) or GND (14). One outlet of second switch should be connected to connector (19) and other one should be connected to SENSE GND (7, 16) or GND (14). Required function 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.

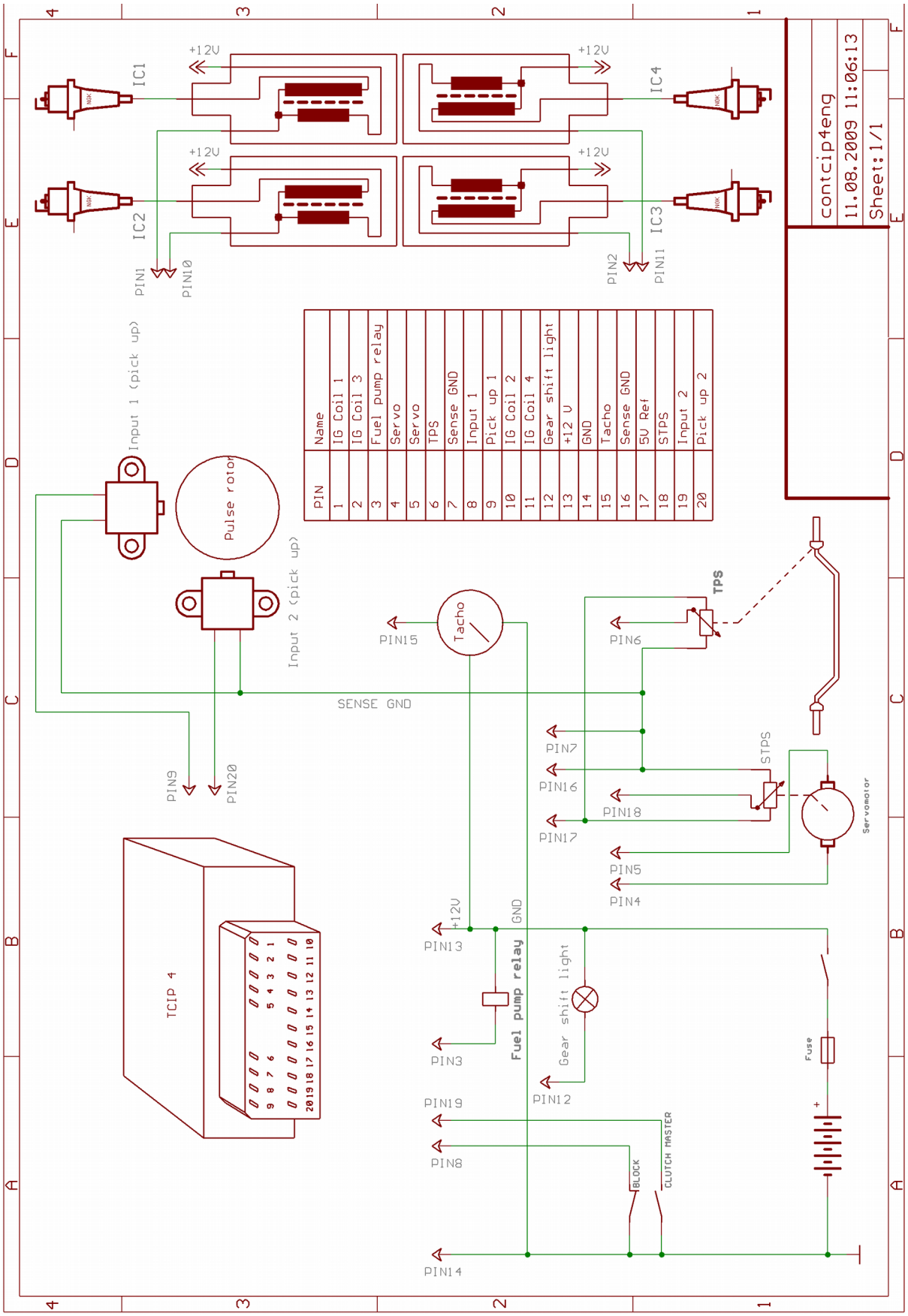
Revolution indicator - TACHO output.
The revolution indicator output is compatible with most of board devices used on motorbikes. Pulse number for one revolution and corrections is set within TCIP4.EXE software. TACHO output should be connected to connector (15).

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.

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	output for fuel pump relay
green	4	M	output for servomotor
green	5	M	output for servomotor
grey	6	TPS	throttle position sensor
blue	7	SENSE GND	ground for sensors
black	8	INPUT 1	switching input 1
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	INPUT 2	switching input 2
brown	20	CKPS (2)	input for pick-up (2)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Sheet:1/1
IC1
IC2
IC3
IC4
+12V
PIN1
PIN10
PIN2
PIN11
PIN Name
1 IG Coil 1
2 IG Coil 3
3 Fuel pump relay
4 Servo
5 Servo
6 TPS
7 Sense GND
8 Input 1
9 Pick up 1
10 IG Coil 2
11 IG Coil 4
12 Gear shift light
13 +12 V
14 GND
15 Tacho
16 Sense GND
17 5V Ref
18 STPS
19 Input 2
20 Pick up 2
Input 1 (pick up)
Pulse rotor
Input 2 (pick up)
PIN9
PIN20
SENSE GND
PIN15
Tacho
PIN6
TPS
PIN7
PIN16
PIN17
PIN18
STPS
Servomotor
PIN5
PIN4
TCIP 4
PIN13
+12V
GND
Fuel pump relay
PIN3
Gear shift light
PIN12
Fuse
PIN19
PIN8
BLOCK
CLUTCH MASTER
PIN14

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.

Com – includes items **Com1** to **Com30 and Com Auto** - this is for selection of communication port. For PC without COM (USB only) you need the apply a USB to RS232 adapter which we can supply.

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]

Set TPS 0 - 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)

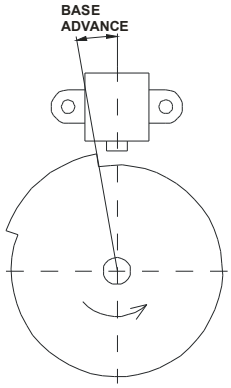
File: - full path of using file

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