

# NEWSLETTER

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## What's New?

Newly released is the 3 axis robot (part no. 16286), shown here, that comes ready-to-run with either the fischertechnik 30402 interface unit or with 24V motors for control by other computer interfaces or controllers. This robot with grabber claw uses 4 DC motors, 4 limit switches and 4 pulse count switches. Axis 1 provides - 180 degrees of rotation, axis 2 - 100mm forwards and backwards movement and axis 3 - 160mm up and down movement.

This robot arm uses the new Power Motor (p/n 34965) which has an in-built 8:1 gearbox for high torque and is particularly suited to high load applications and for motorising vehicles (the new Cars & Truck kit uses this motor). I have to say that it's almost impossible to stop this motor's rotor when running from a 9VDC mains supply!

For battery powered applications, the new 'Accu Set', p/n 34969, is now available. Providing 8.4V/940mAh of rechargeable energy with a microcontrolled re-charger for optimum battery life.

Procon Technology is also offering a special ready-built service for any model in the Pneumatic Robots Kit (34948) or the Industry Robots Kit

(30408) for a nominal fee when purchasing the complete computer kit (34948-2 or 30408-2).

## On the Net

For Australians, significant price reductions have occurred on all fischertechnik kits as a result of the introduction of the GST. And although prices on software should have increased by 10%, Procon Technology has absorbed this cost increase and maintained prices on all software! See:

[www.procontechology.com.au](http://www.procontechology.com.au)

## Universal Mania

A curriculum guide is now available for use with the fischertechnik Universal Kit (p/n 30308). Suitable for primary schools grades 3 and up, the Universal Kit constructs 24 everyday products that can be used to teach the mechanical principles of; Pulleys, Levers, Screws, Wheels and Gears.

The curriculum guide and teacher's manual is available separately and provides 17 activity cards with two levels of ability and a

teacher's manual explaining the use of the activity cards and the answers to questions on the cards. The booklet may be freely copied for use in the classroom when used with the Universal Kit.

## Slave Module

The extension module (p/n 16554) has finally arrived. This module connects by ribbon cable to the 30402 'active' interface and extends the number of outputs from four to eight (M1 to M8) and the number of inputs from eight to 16 (E1 to E16).

Software support for this module is already provided with fischertechnik's flowchart style language (LLWIN) allowing all inputs and outputs to be addressed. Procon Technology will also provide a special driver for the extension module with example programs, including a diagnostic program, with any 16554 purchased.

## Software

Besides the release of software for the slave module (16554) above, Procon Technology has released software for the Pneumatic Robots Kit for all four models.

The basic version of software, provides examples in QBASIC and VisualBASIC for Windows. While the full version provides additional example programs in Delphi (Pascal) and VisualC. This diskette also provides examples for the Mobile Robots kit and the Industry Robots kit.

For a limited time only, the basic version along with the LLWIN software will be provided at no extra cost with any Pneumatic Robots kit with interface (34948-2) purchased.

## AVR Basic...

Controller or ABC for short is the latest and hottest microcomputer board available in Australia. Forget BASIC Stamps, this unit is programmed in a compiled BASIC language and executes 8 million instructions per second ... that's right ... 8 million per second! You just won't believe how easy this small microcomputer (measuring just 20mm by 70mm) is to program.

Procon Technology has used this amazing unit to control the fischertechnik 30402 serial interface and the lower-cost 16554 expansion module directly. We were so impressed that we are now distributors of the ABC boards and kits.

Two versions of the microcontroller are available; the ABC mini and the ABC maxi. Full details and specifications are provided on our website. Kits are also available with programming cable (which plugs into the printer port), serial cable and programming software. Special kits, with example software, are also available for connecting the mini-board to the fischertechnik 30402 or 16554 interfaces.

Finally, a special version of the 30400 Mobile Robots Kit is available from Procon Technology which includes the 16554 slave module, the mini-board and connecting cables and example software for all eight models. A great starter kit for schools or universities interested in competing in the RoboCup Challenge!

Just to give you some idea of the power of this microcomputer, the Mobile Robot could be programmed with up to 350 unique steps if programmed in BASIC and with up to 2,000 steps if programmed in assembler! Here's an example in BASIC:

```
o=20
call TurtleForward
o=4
call TurtleLeft
o=40
```

```
call TurtleBack
o=9
call TurtleRight
```



number of inputs used with the kink-arm robot from eight to four!

This time we're going to show you how to reduce the number of outputs used.

You will notice in the Pneumatic Robots kit (34948) how a solenoid that drives a pneumatic cylinder in one direction requires one output (M1) and to drive it in the opposite direction requires a second output (M2). Well both solenoids can be connected to one output by using two diodes (IN4004 or equivalent) as shown in the following circuit:

## Hints & Tips

1. The following QBASIC program shows how to communicate with the 30402 interface with the 16554 slave module attached:

```
OPEN "com2:9600,n,8,1,bin,cs0,ds0" AS 1
B1 = 194          'Command byte
B2 = 1            'Motor M1..M4
B3 = 2            'Motor M5..M8
PRINT #1, CHR$(B1);CHR$(B2);CHR$(B3);
B4 = ASC(INPUT$(1, #1)) 'Get E1..E8
B5 = ASC(INPUT$(1, #1)) 'Get E9..E15
```

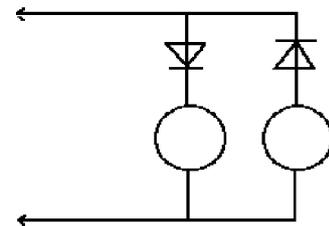
More details are available on our website. Also anyone who has been using our software will be able to easily update programs for the old 30520 interface (using two of these is the same as using the 30402 with 16554). For example the following program will now work:

```
DO UNTIL SwitchIn(E15)
    Motor M8, MCW
LOOP
Motor M8, MOFF
```

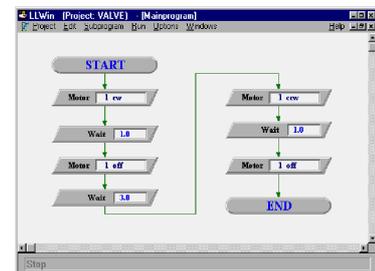
Don't forget we provide the drivers and example programs in VisualBASIC for Windows when you purchase the 16554 from us!

2. Sometimes the red and green fischertechnik plugs become loose when inserted into sockets. Simply use the fischertechnik screwdriver provided to splay apart the four sections of the plug to make it tight again.

3. In the last newsletter we showed you how to use a humble diode to reduce the number of inputs required on the interface unit. For example, you could reduce the



The program below shows how to control the cylinder using LLWIN:



The same program in VisualBASIC would be:

```
Motor M1, MCW
Delay 1000
Motor M1, MOFF
Delay 3000
Motor M1, MCCW
Delay 1000
Motor M1, MOFF
```

This circuit could also be used to control two lamps or perhaps two motors. The lamps could be flashed alternatively or one motor runs and then the other. Note, the only way to operate both lamps or motors at the same time would be to alternate from CW to CCW rapidly, this would then provide half intensity or half speed ... so experiment and see what happens.