

NEWSLETTER

1st issue 2002 edition

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Bionic...

...Robots have arrived! This kit (p/n 57486) constructs four walking robots - two hexapods (6 legged), one quadruped (4 legged) and one biped (2 legged). Fischertechnik has given them names like; Mike, Jack, Joe and Jim! Each model is driven by two power motors which are controlled by the 'intelligent' interface unit allowing autonomous operation away from the computer.

For years, researchers from various universities around the world have been experimenting with walking robots - now it's possible to build, program and play with these robots at home or at school!

The 57486 kit contains; 2 power motors, 6 switches and more than 300 other parts. A detailed assembly manual and an activity manual is also provided.

Procon Technology provides the option of purchasing a 'complete' kit (57486-2) with 30402 interface, 30407 LLWIN software and 34969 Accu Set (rechargeable battery and re-charger). Also available is the 57486-3 Bionic Robot kit with ABC (AVR Basic Controller) plus 16554 slave module and Accu Set.

Please note, it is possible to use the 30263 battery holder (with 6 x AA

batteries) in place of the Accu battery. The 30263 is provided in the Mobile Robots kit (30400) or it may be purchased separately.

On the Net

Don't forget to check our website for the latest information, free software and discount specials:

www.procontechnology.com.au

If you wish to be notified as soon as the latest newsletter is published on the web or about specials just email us at - procon@tpg.com.au

Software

Fischertechnik has released a FREE upgrade to LLWIN version 3. The version 3.03 upgrade file may be downloaded directly from the German website www.fischertechnik.de or from our software webpage. The new version is mainly for those using Windows XP or NT. Don't forget that you can also download a FREE working copy of LLWIN for evaluation purposes. LLWIN is an easy-to-use flowchart style programming language designed especially for machine control applications.

Procon Technology now provides both 16 bit and 32 bit versions of VisualBASIC software with all COM-

PLETE computer kits purchased (excluding 57486). All versions of Windows are now supported. Half price upgrades are also available.

LLWIN version 3 example programs for the Profi Computing Kit (30490 or 30330) are now available for download from our software webpage. We have also added example programs for the 'Tune Memory Game' and the 'CD-Reader'. Note, limited stocks of the Profi kit are still available!

Two projects from the Profi kit may also be constructed with the Computing Starter Kit (16553 or 18353). They are; the 'Reaction Tester' - consisting of two lamps and two associated switches - which allows you to compete with your friends for the quickest reaction time by waiting until one of the lamps is lit and then hitting the associated switch as soon as possible. The other project is the 'Tune Memory Game' - consisting of 3 or 4 lamps and associated switches - which plays a series of notes whilst illuminating the lamps and expects the player to repeat back the sequence until an error is made. The one that can play the longest sequence is the winner!

Eco Power

The new Profi Eco Power kit (p/n 57485) is now available. This 'alternative energy' or 'renewable energy' kit provides 8 projects with examples of water, wind and solar power generation. In addition energy storage, with the use of a 10 Farad gold capacitor, is illustrated. This capacitor is capable of driving the energy-efficient motor/generator in the kit

for more than 20 minutes when fully charged. The motor operates between 0.3 and 2 Volts and would run for more than 10 days on a single 1.5V AA alkaline battery! There are also some creative uses of the solar cells in the kit - for forward and reverse operation of a hoist and to track the sun (i.e. solar tracker).

Our own evaluation of this kit (shown on this page) suggests that it is excellent for those interested in alternative energies and for schools interested in experimenting with this technology. Any of the eight models can be constructed in 10 to 15 minutes making it ideal for a 45 minute lab class in primary or secondary schools.

The kit contains over 150 parts with an easy-to-follow assembly manual and an activity booklet that explains the operation and use of the technology. As a special introductory offer Procon Technology will provide a FREE digital multimeter (for measuring volts, amps etc.) with every kit purchased!

Hints & Tips

With fischertechnik using the Accu Set (Accu means accumulator) more and more, I thought it might be a good time to discuss battery technology and how to get the most out of your batteries. Before starting, there are two things that need to be understood. Firstly, a batteries voltage is important. With a higher voltage your motors will run faster. With a lower voltage the motors will run slower - that's what happens the longer a battery is used. For example, a standard AA battery will start at 1.5 Volts and discharge to 1 Volt, after which it will need to be disposed of or recharged. The amount of time that the battery can be operated is referred to as the battery capacity. A batteries capacity is measured in Ah (Amp hours) or mAh (milliAmp hours) where 1Ah = 1000mAh. If a batteries capacity is 1Ah (roughly the



capacity of the Accu battery) then you could run a 1 Amp device for 1 hour or a 0.1 Amp device for 10 hours. If it's a rechargeable battery then the converse is also true when recharging the battery. E.g. Since the Accu Set will recharge in 2 hours then it's recharge current must be more than 0.5 Amps. OK?

The cheap non-rechargeable carbon or alkaline batteries are recommended for use in low drain applications (e.g. remote controls, clocks etc.) however for high-drain, frequent use applications (e.g. toys, CD player, torches etc.) you would have to be mad not to buy rechargeable batteries. These cost a bit more but can be used many times over and over again.

There are three types of rechargeable batteries that we will consider here. Firstly, when a AA size battery is required (such as in the Mobile Robots kit), I would recommend the rechargeable alkaline battery. There are two types available in Australia, they are the Grandcell and the BIG. The Grandcell batteries and charger can be bought in most major supermarkets and retail stores. The price is quite reasonable considering that you can get 25 times the use out of one of these batteries compared to a standard alkaline battery - that's a saving of over \$100 on a cost of only \$30 for 4 batteries and a charger. If you use additional batteries - the savings are even greater! The advantage of these batteries over other rechargeable types is that they have a full 1.5 Volt output, they have a high capacity, they keep their charge over long periods of time (up to 5 years) and they can be used

anywhere a standard alkaline is used - including toys and cameras which say 'no rechargeables'.

The most common type of rechargeable battery is the Nickel-Cadium or Ni-Cad. They are most commonly used in battery packs such as the fischertechnik Accu battery. Inside this battery pack is 7 x AA batteries connected in series - since each battery is 1.2 Volts only - that makes a total of 8.4 Volts. The capacity of a Ni-Cad AA battery is around 1Ah. The major drawback with the Ni-Cad is the 'memory-effect' which means you should always fully discharge this type of battery before recharging it to full capacity. Fischertechnik assure me that this does not apply to the ACCU SET! You may recharge the ACCU battery at any time using their charger.

The other type of rechargeable battery - that can be used in place of the Ni-Cad - is the Nickel Metal Hydride or Ni-MH. This type of battery is 1.2 Volts also, can have 50-80% more capacity in the same size and doesn't suffer from the 'memory effect'. The same low-cost re-charger can be used for the Ni-MH as the Ni-Cad.

One of the problems with series connected batteries is that weak cells may have a reverse voltage applied to them - for this reason you should only use the same make and type of fully-charged batteries in any device! If this happens to an alkaline rechargeable cell then you'll probably have to throw it away! If it happens to a Ni-Cad or Ni-MH battery then try recharging it. Fischertechnik says that the re-charger may initially indicate 'fully charged' (light glows constantly) but after a while it will start to recharge correctly (light flashes). If your battery pack still doesn't work - don't throw it away! Often you can open it up and either recharge the cells individually or replace the bad cell. If you don't wish to do this, then we will accept your old Accu battery as a trade-in on a new one!