MULTIPLEX Profi car

Transmitter for radio controlled models

Technical description of basic transmitter and RF section

Manufacturer:	MULTIPLEX Modelltechnik GmbH Neuer Weg 2 D-75223 Niefern-Oeschelbronn Germany
Type designation:	MULTIPLEX **Profi car 403 and Profi car 707**
Mode of operation:	One-way symbolic transmission
Operating voltage:	7.2 Volt +/- 10% Ni/Cd battery, 600 mAh
Number of control functions:	Profi car 403 4 functions Profi car 707 7 functions AM mode 2 functions, both versions
Aerial:	Screw-fitting telescopic aerial, approx. 100 cm

Description of function, signal section:

The Profi car 403 and 707 devices are of identical construction. The **Profi car 403** is the standard version which includes all the essential functions required for controlling ground-based vehicles. It provides control of four functions. A maximum of three user-defined memories can be used to store control travels and function assignments. The **Profi car 707** features additional auxiliary functions and three extra control functions, and the number of memory spots is increased to seven. The electrical and mechanical construction of the two devices are identical.

The central control unit of the main circuit board of the Profi car radio control transmitter consists of an AT-Mega603 RISC micro-controller made by the ATMEL company. This part is designated IC 4 in the circuit diagram.
The micro-controller contains a programmable flash ROM in which the program data are stored. The micro-controller also includes RAM (Random Access Memory) and an EEPROM for permanent storage of the transmitter-specific set-up data. The controller's pulse oscillator is frequency-stabilised by means of a crystal operating at a frequency of 8 MHz.

IC 2 (TC1055) generates a stabilised voltage of 5 Volts. This voltage serves as power supply voltage for the micro-controller, reference voltage for the A/D converter and as power supply voltage for the transmitter controls. This module also monitors the operating voltage and produces a defined reset signal when the transmitter is switched on.

The transmitter is operated by means of the integral main central control, which provides steering and throttle control of a model vehicle. Grouped around the main control are additional operating elements in the form of momentary switches, rotary controls and digital controls. The top surface of the transmitter features a keypad comprising 5 separate buttons which are used for entering data and switching functions on and off. The function of the controls and buttons varies according to the current mode of operation of the transmitter. The analogue values of the controls are passed to the analogue inputs ADC0 to ADC4 of the micro-controller IC4.

The switched state of the momentary switches and of the incremental control are read-in via the port inputs PA, PB to PD in digital form. The RF module is modulated and the AM-FM mode is selected via the port PE.

An application-specific LCD screen serves as display for the battery state and the transmitter functions, and is controlled by the LCD driver IC1. The LCD driver and screen unit are located on a separate circuit board, connected to the main circuit board via a connector. The system also includes an audible warning for indicating low battery voltage.

The socket D1 serves as charge socket for the integral Ni/Cd battery.