



Intelligent Serial

A 68000 based controller with 3 Serial Ports

The drawing opposite is a block diagram of the 3 channel Intelligent Serial Controller.

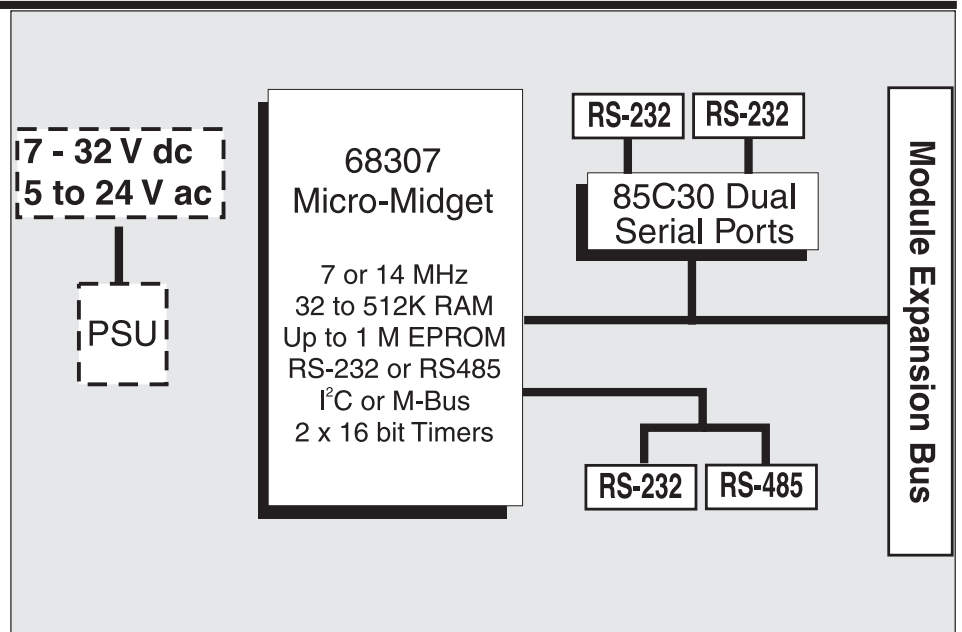
Features

- ❑ 68000 32 bit Compatible CPU
- ❑ 7.3728 MHz or 14.7456 MHz
- ❑ Up to 1 M-Byte EPROM
- ❑ Up to 512 K-Byte RAM
- ❑ Two 16 bit Timer/Counters
- ❑ 8051 peripheral interface
- ❑ I²C or M-Bus Expansion Port
- ❑ Expansion Bus interface
- ❑ Two RS-232 Serial Ports
- ❑ One RS-232/RS-485 Serial Port
- ❑ 75 to 38400 baud
- ❑ 1, 1½, 2 stop bits
- ❑ 5, 6, 7, 8 data bits
- ❑ None, Odd or Even parity
- ❑ Software Support for C or Modula-2
- ❑ Minos Operating System
- ❑ Optional Power Supply

Description

The 3 channel Intelligent Serial Controller is a product based on Cambridge Microprocessor Systems innovative Micro-Midget Controller. This controller is a small 32/16/8 bit 68000 based board. The micro-controller at the heart of the product is a MC68307 device which integrates a 68000 code compatible core with two 16 bit timer counters, a serial port, I²C or M-Bus controller interface and an 8051 multiplexed bus interface. The program to control the boards operation is located either in the 32 pin EPROM which takes a standard JEDEC EPROM or in the static RAM. The static RAM socket can be populated with either 32K-bytes of RAM for most target applications, 128K-bytes of RAM for standard development environments or 512K-byte RAM for applications that need large areas of memory or buffer space. The CPU can be clocked at 7.3728 MHz for low power operation or at 14.7456 MHz if processor speed is required.

This unit has a total of three asynchronous serial ports. One of the three serial ports is provided by the UART within the 68307, the other two ports are provided by a 85C30 DUART on the base board. All three serial ports can operate over a wide range of parameters. Baud rates can vary from 75 baud



up to 38400. Data lengths can be between 5 and 8 characters with 1, 1½ or 2 stop bits. Error checking can be enabled by using odd or even parity. All three serial ports can be used for communication to devices using RS-232 protocols. The extra voltage levels required for the RS-232 communication are generated on the board using charge pump devices. Hardware handshaking using RTS and CTS is implemented for all the RS-232 serial ports. Alternatively the third serial port (from the 68307) can be used as an RS-485 network port. This will allow many units to be connected together over long distances and communicate to a master controller. The RS-485 network utilises a differential protocol virtually eliminating any errors caused by induced electrical noise common in industrial, scientific or commercial environments. When used with the network option the unit will listen to the serial line unless it is talking to it. All the serial port signals are connected to 10 pin IDC type sockets. These are compatible for connecting the unit directly to a 9 pin PC serial port.

All the devices on the Intelligent Serial Controller require a single 5 volt supply to operate. As such a supply is not a common occurrence in industrial or scientific environments the controller can be supplied with a switch mode power supply integrated on to the board. This power supply enables the board to be powered from a wide range of sources. The supply can be between 7 and 32 volts d.c. or 5 and 24 volts a.c.. Because the power supply features a switch mode regulator the supply signal does not need to be very stable as long as it remains within the specified ranges. All the

switching components are screened within an inductive shield and a ground plane is provided in this area to reduce any leaking interference caused by the fast changing signals.

P.C. Development

This product can be developed using its own Development Pack or via the Micro-Module or Micro-Midget Development or Starter Packs. The pack will provide all that is required to develop your application. All packs are supplied with the relevant board fitted with an EPROM containing the development environment and a 128K SRAM, documentation, interface cables and P.C. utilities to enable you to generate EPROM code for your application. The C packs are supplied with an integrated editor, C compiler, cross assembler, linker and library manager. All packs use the Minos Real Time Operating system to interface to the hardware. This reduces development time dramatically by allowing the developer to concentrate on their application while the operating system takes care of all the hardware. The operating system makes it very easy to access different devices. By opening a path to a device you can communicate with the device in a universal format. Examples of such devices are serial ports, printer ports, LCDs and even files can be considered as devices. For example, the C program below will set up one of the serial ports to communicate at 4800 baud with 2 stop bits and then write a string out of the serial port ten times. When the device is opened the operating system allocates some space in the RAM to function as buffers and sets up an interrupt vector to service the serial port.

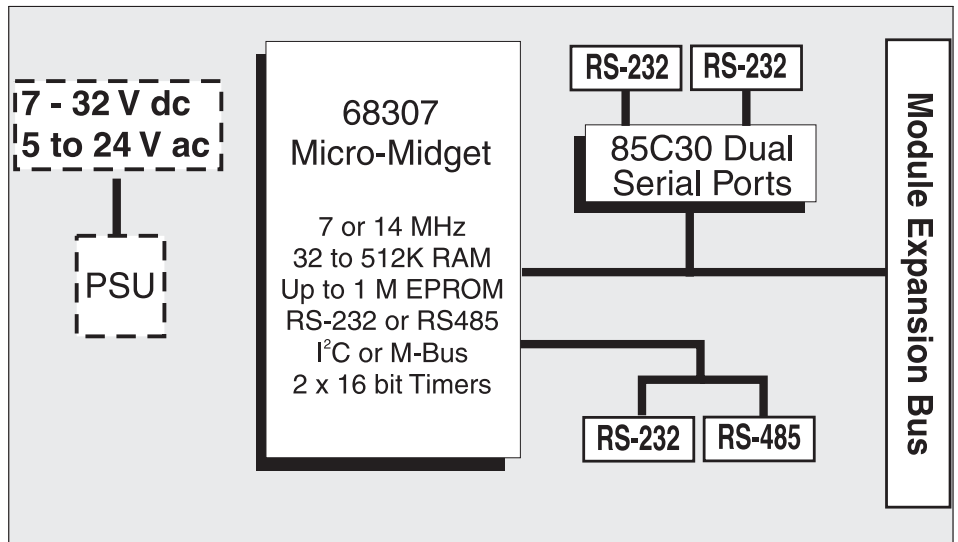
```
#include <stdio.h>
#include <minos.h>
void main( void )
{
    FILE *serial;
    int count;
    baud("S1",4800);
    stops("S1",two);
    init("S1");
    serial = fopen("S1","w+");
    for (count=0;count;count++)
    {
        fprintf(serial,"This is a simple message\n");
        fflush(serial);
    }
    fclose(serial);
}
```

The same code above can be written in Modula-2 and will look like this:

```
MODULE Serial;
FROM InOut IMPORT WriteString,
WriteLn;
FROM Fio IMPORT Open, Baud, Stops,
Init, two;

VAR    serial, x : INTEGER;

BEGIN
    Baud("S1",4800);
    Stops("S1",two);
    Init("S1");
    serial := Open("S1");
    FOR count = 0 TO count = 10 DO
        WriteString(serial,"This is a simple
            message");
        WriteLn(serial)
    END;
    Close(serial)
END Serial.
```



Specification

Processor

MC68307 Motorola CPU
7.3728 MHz (14.7456 MHz option)

Memory

Up to 512 K-byte SRAM
Up to 1 M-byte EPROM

Serial Ports

Three asynchronous serial ports
Two RS-232 buffered
One RS-232 or RS-485 buffered
75 to 38400 baud
Separate Rx and Tx baud rates
5, 6, 7 or 8 data bits per character

1, 1½ or 2 stop bits
None, Even or Odd parity

Timer/Counters

2 independent 16-bit Timer/Counters

Expansion Bus

68000 Expansion
I²C or M-Bus Expansion
8051 peripheral expansion bus
Compatible with wide range of peripheral boards

Power Supply

5 Volt only operation
typ. 100 mA @ 5V

with optional Power Supply fitted

7 to 32 Volts dc
5 to 24 Volts ac

Environmental

0 to 70 degC, 0 to 90% RH

Order Codes

K-055[options]	3 Channel Intelligent Serial Controller RS-232
H-055	3 Channel Intelligent Serial C Starter Pack
J-055	3 Channel Intelligent Serial Modula-2 Starter Pack
K-800	8 Channel Serial I/O
K-600	2 Channel Serial, Digital & Printer

Options

N	2 x RS-232 and 1 x RS-485
L	128 K RAM
D	14.7456 MHz operation
P	Power Supply

k-055 970307



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