M8KSerial

The M8KSerial is an enhanced serial interface module for Excalibur's 8000 family of multiprotocol carrier boards, that includes several advanced features such as a high baud rate and high throughput. This module supports up to two independent channels of serial communications, each of which can be selected as RS-485, RS-422 or RS-232. The module operates independently of the host computer, reducing the need for host intervention. The M8KSerial module is software compatible with industry standard 16550 Universal Asynchronous Receiver/Transmitters (UARTs).

Each of the M8KSerial's two channels contains a transmit FIFO capable of holding up to 16384 bytes and a receive FIFO capable of holding either 16384 receive bytes or 5460 bytes with a 32-bit Time Tag associated with each byte. These large buffers allow application code to transfer large quantities of data with a single non-blocking subroutine call. The 32-bit Time Tag on receive channels is very useful for synchronizing serial data with data from other modules on the 8000 board or on other interface boards. Each channel has a programmable baud rate of up to 10 Mbps.

General Features

♦ Up to two independent serial channels
♦ Software compatible to industry standard 16550 UARTs
♦ Hardware preset to RS-232, RS-422 or RS-485 communications
♦ Up to 10 Mbps asynchronous operation per channel
♦ FIFO data buffers for both Transmit (16K x 9) and Receive (16K x 16) per channel
♦ Receive data break, frame, parity and overrun errors detection
♦ Data rates are selectable, via the on-board Baud Rate Generator and the configuration registers for each channel, from 50 bps to 1 Mbps for RS-232 and from 50 bps to 10 Mbps for RS-422 and RS-485
♦ Selectable input clock: 14.7456 MHz, 24.0 MHz, 32.0 MHz or 40.0 MHz
♦ 120 Ohm termination resistors on RS-422 and RS-485
♦ Provides Loop-back testing
♦ IRIG B input (standard IRIG B120 Serial Time Code)
♦ 32-bit Time Tag or 64-bit IRIG B Time Tag
♦ Programmable Time Tag resolution: 1 or 10 microsecond
♦ Interrupts on: Receive data, Parity error, Stop Bit error, Tx FIFO Empty, Receive Count, Receive Pattern Match
♦ RS-422 and RS-485 true fail-safe receivers
♦ Transmitters and receivers protected against wiring faults
♦ Burst mode transfers on PCIe carrier boards
♦ Total transmit/receive byte counters
♦ Programmable gap between transmitted bytes
♦ Extended temperature option

Physical Characteristics

♦ Dimensions: 46mm x 30mm
♦ Weight: 9g

Operating Environment

♦ Temperature: 0°–70°C standard temperature
-40° to +85°C extended temperature (optional)
♦ Humidity: 5%–90% noncondensing
♦ MTBF: 789,300 hours at 25°C, G_F, S217F

Host Interface

♦ EXC-8000 family of carrier boards
♦ Power (J6): 5V @ 410mA

Software Support

♦ *Software Tools:* Intuitive and flexible API with source code
  ♦ Compatible with 32/64-bit Windows 7/8/10/11 & Linux kernel 3.x/4.x/5.x
  ♦ Includes application interface for NI LabView & CVI
♦ GUI application for Windows (see page 2)

Ordering Information

♦ **M8KSerial-Jx** Serial interface module with two RS-232/422/485 channels. Replace 'J*x*' with one of the following:
  J1 Ch0 is RS-232, Ch1 is RS-232
  J2 Ch0 is RS-232, Ch1 is RS-485
  J3 Ch0 is RS-232, Ch1 is RS-422
  J4 Ch0 is RS-485, Ch1 is RS-485
  J5 Ch0 is RS-485, Ch1 is RS-422
  J6 Ch0 is RS-422, Ch1 is RS-422
♦ Additional Options:
  -E Extended temperature option
  -R Ruggedized option
  -001 With conformal coating
Note: When ordering this module with a carrier board, use the module code specified in the user's manual of the carrier board.

These specifications are subject to change without notification

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M8KSerial – Software Application

The M8KSerial module comes with Excalibur's Serial Simulation Laboratory application, which enables you to utilize our module's advanced capabilities, by simply specifying your Serial data protocol in an Excel spreadsheet, simulating messages and monitoring your communication.
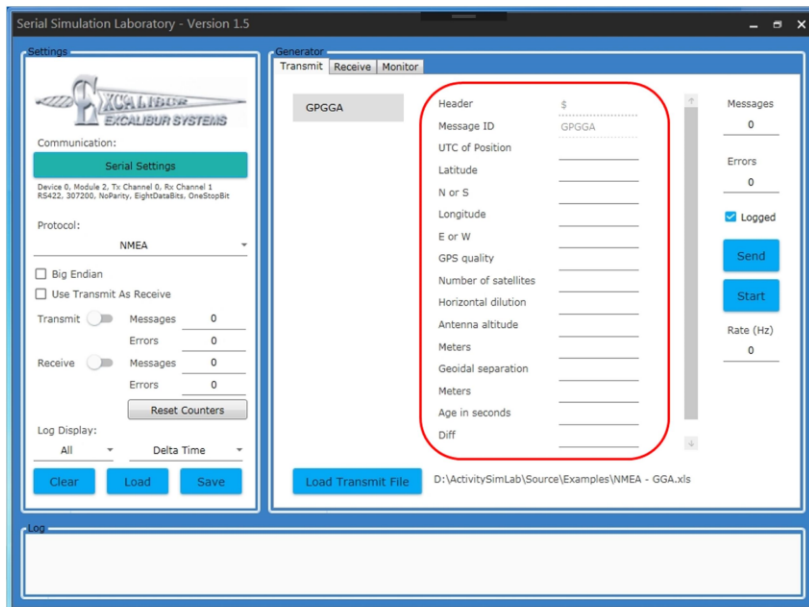
Features

♦ Simulate transmit and receive messages on the Serial bus.

♦ Messages are configurable using an Excel spreadsheet; automatically generating a per-massage GUI.

♦ Monitor the Serial bus at byte level with deep FIFOs, a high resolution Time Tag and Status.

♦ View and save a log of the transmitted and received messages.

Benefits

♦ Single solution for testing multiple Serial data protocols.

♦ Works seamlessly with Excalibur serial modules.

♦ No coding necessary.

♦ Low latency.

	A	B	C	D	E	F	G
1	Field Description	Units	Data Type	Len. in	Min/Value	Max/Value	Comment
2	Header	[%s]	const	1	$		
3	Message ID	[%s]	const	5	GPGGA		
4	UTC of Position	[%s]	ascii	0			
5	Latitude	[%s]	ascii	0			
6	N or S	[%s]	ascii	0			
7	Longitude	[%s]	ascii	0			
8	E or W	[%s]	ascii	0			
9	GPS quality	[%s]	ascii	0			
10	Number of satellites	[%s]	ascii	0			
11	Horizontal dilution	[%s]	ascii	0			
12	Antenna altitude	[%s]	ascii	0			above/below
13	Meters	[%s]	ascii	0			
14	Geoidal separation	[%s]	ascii	0			
15	Meters	[%s]	ascii	0			
16	Age in seconds	[%s]	ascii	0			since last
17	Diff	[%s]	ascii	0			
18	Checksum	[%s : 1.0 : 0 : NMEA	checksum	2			

Excel Spreadsheet with
User-defined Messages

Serial Simulation
Laboratory
Running on Host PC

Excalibur Board
with Serial Module

RS-232/422/485

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