

..... for the CMX7032 Marine AIS Class B Processor IC

### Features

- Class B AIS Transceiver Technology Demonstrator
- Designed to meet IEC62287
- 2 Watt Tx operation
- Dual, independent GMSK receivers
- C-BUS Interface to host  $\mu$ C

### Features (Continued)

- 19.2MHz Reference for 9600bps data rate
- Dual Channel Rx-only operation
- On-board EEPROM
- RS232 NMEA-0183 Interface for host-less operation
- Flexibility built on *FirmASIC*<sup>®</sup> technology



### Brief Description

The DE70321 is a complete AIS Class B (IEC 62287) technology demonstrator aimed at speeding manufacturers' design and development of AIS Class B and AIS receiver products using the CMX7032 AIS Class B Baseband Processor with RF Synthesiser IC. The design is a flexible platform to allow users to configure and evaluate with two build options:

- Class B Transceiver (using CMX7032 FI-1.x)
- Dual Channel Rx-only (using CMX7032 FI-2.x)

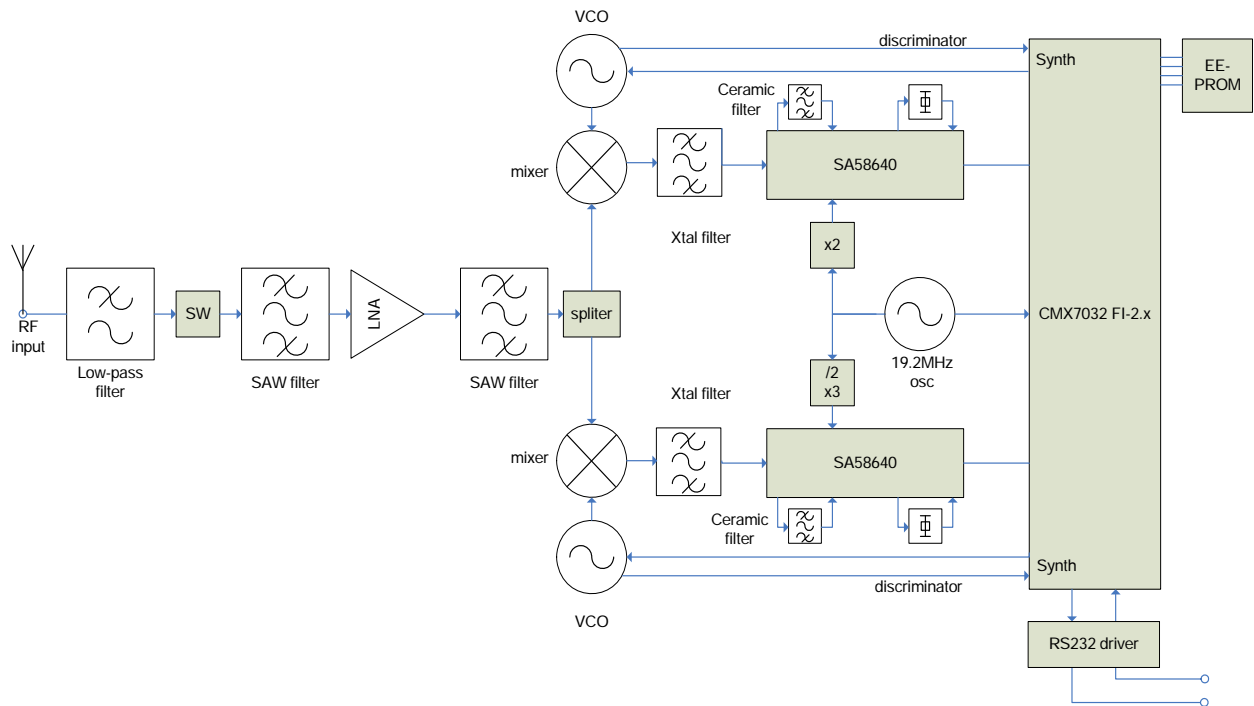
The default board configuration is for dual channel receive on 161.975MHz (AIS channel 1) and 162.025MHz (AIS channel 2) with 25kHz channel spacing and 9600bps over-air data rate. An EEPROM is included which can automatically load the Function Image<sup>™</sup> FI-2.x into the CMX7032 at power-up. Received data is automatically provided as NMEA 0183-HS sentences at 38,400bps from the DB9 RS232 port.

Function Image<sup>™</sup> FI-1.x allows full host control over all CMX7032 functions whereas Function Image<sup>™</sup> FI-2.x automatically programs the CMX7032 RF synthesisers to the correct frequencies.

All necessary RF circuits, such as VCOs, a 2 watt PA, harmonic filter, antenna switching and LNA, are provided on the DE70321 to facilitate easy evaluation and demonstration of the design as a Class B unit. A C-BUS interface is provided for control of the CMX7032 by a host microcontroller (required to perform the higher level protocol functions on a Class B implementation).

The design is production engineered for low cost, with minimum number of component types and values and uses only low-cost off-the-shelf components.

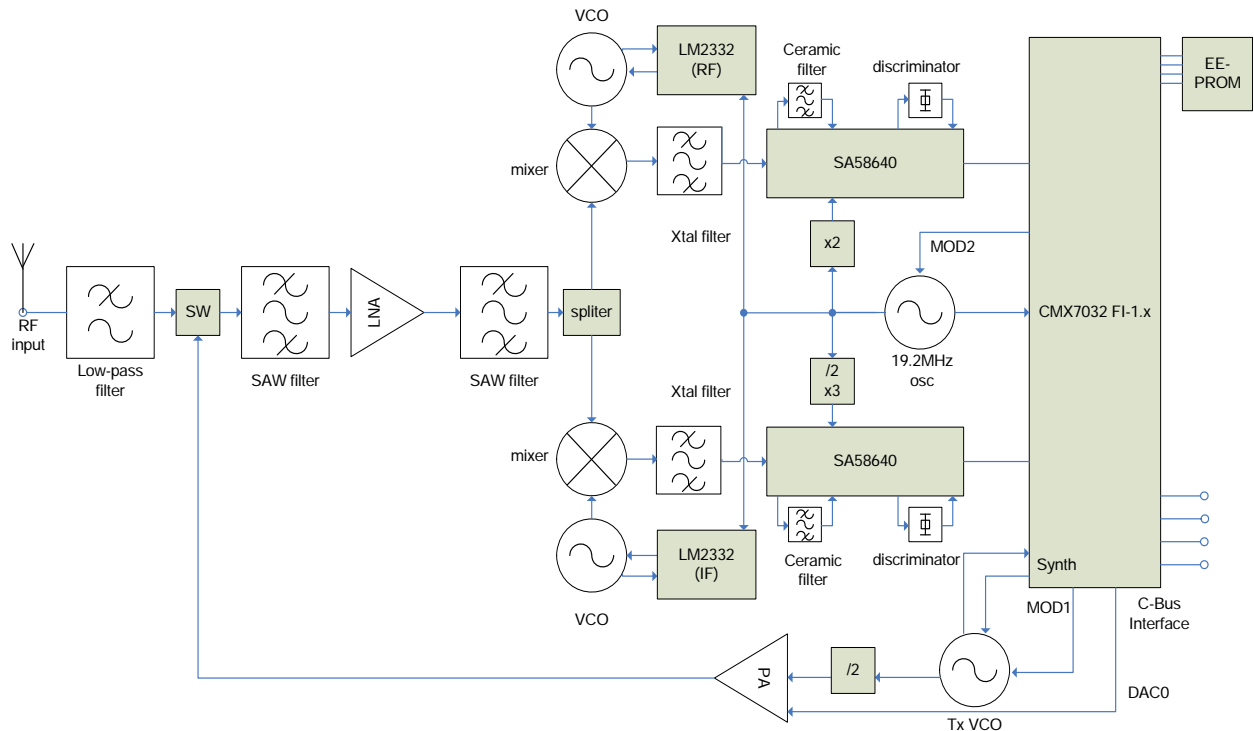
### Rx-only Block Diagram



To get the demoKit up and running as an AIS Rx-only Demonstrator, the following additional items are required:

- Power Supply
- 162MHz antenna and cord with an SMA connector
- PC with RS232 port
- PC program such as 'Ship Plotter' [[www.coaa.co.uk/shipplotter.htm](http://www.coaa.co.uk/shipplotter.htm)] to display received data
- RS232 connection cable
- Optionally, a GPS receiver can be connected via an RS232 splitter if you wish to display your actual location

## Tx-Rx Block Diagram



To get the demoKit up and running as an AIS Class B Transceiver Reference-Design Demonstrator, the following additional items are required:

- Power Supply
- 162MHz antenna and cord with an SMA connector
- Host Microcontroller
- Customer application program
- Connection to a GPS receiver
- Connection to a chart display (optional)
- RS232 port to chart plotter/PC

## Preliminary Information

The DE70321 provides a platform for the evaluation and demonstration of the CMX7032 using either FI-1.x (Class B transceiver) or FI-2.x (Rx-only).

To use the DE70321 in Class B transceiver mode, a separate micro-controller is required to provide control and perform the higher levels of the Class B protocol and user interfaces. The micro-controller can also be used to load the Function Image™ (FI) into the CMX7032 via its C-BUS interface. The PE0001 (see [www.cmlmicro.com](http://www.cmlmicro.com) for more information) is available to provide the basic controller functionality from a PC interface when using FI-1.x.

The DE70321 can also be used in Rx-only mode with FI-2.x. In this mode, typical operation is to use the EEPROM on the DE70322 which will automatically load the FI at power-on. NMEA-083HS data is then automatically output on the RS-232 port as soon as valid data has been detected. A simple terminal application running at 38,400baud, 8 bits, no parity, no handshake will display the information received.

If a suitable antenna for the AIS frequencies (162MHz) is connected, the received data can be used with chart plotting software in order to display local AIS activity. This assumes that the test location is within reasonable range of AIS equipped vessels.

- The choice of EEPROM or Host mode is available for FI-1.x using the 'BOOTEN' pins. For FI-2x both EEPROM and RS232 modes are available.

**Products**

DE70321 Demonstration Kit  
CMX7032 IC with FI-1.x and/or FI-2.x  
CMX7032 package styles:  
    CMX7032L9 64-lead LQFP  
    CMX7032Q1 64-nolead VQFN



**CML website** [www.cmlmicro.com](http://www.cmlmicro.com)

Product overview  
Product preview document  
Datasheet






**CML technical portal (My CML)** (authorisation required)

CMX7032 Datasheet + user manual  
DE70321 DemoKit user manual  
Evaluation kit design support (separate authorisation required)

- Full schematic diagrams
- Bill-of-materials (BOM)
- Gerber files

Application notes  
FAQs



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