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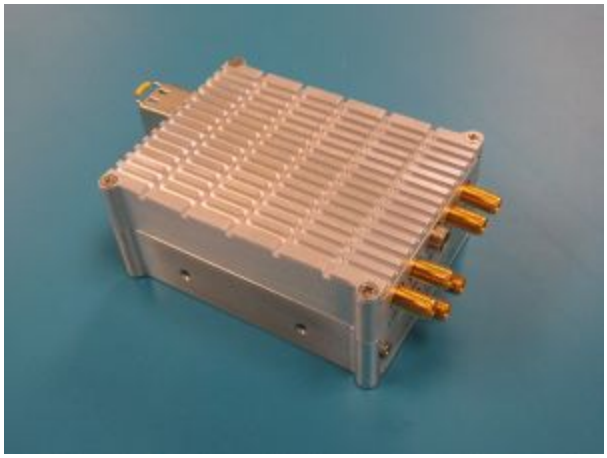
ICE-GigEXD-r2

Self-contained Data Conversion Device

The GigEXD is a self-contained data conversion device. Input data type interfaces include A/D, ECL, PECL, LVDS, SONET, etc., that are converted to output Gigabit Ethernet data. Once digital data enters the GigEXD, it can be sent directly out via Gigabit Ethernet, or optionally, pass through embedded digital tuners for tune, filter, decimate, and gain operations before output to Gigabit Ethernet. The output Gigabit Ethernet interface employs the Gigabit SFP (Small Form-factor Pluggable) modules which allow for either copper or fiber network connections. (See Features on this page for more details.)



GigEXD-r2 Side

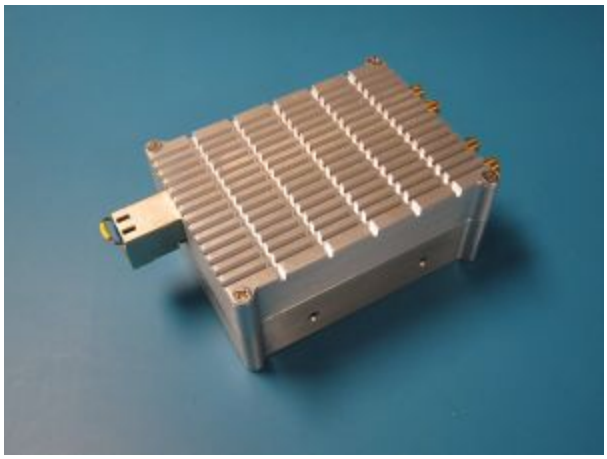

GigEXD-r2 Top (1)

The GigEXD's modular design allows for the use of standard ICE I/O modules. The I/O module data is converted to Gigabit Ethernet traffic using multicast UDP packets that conform to the SDDS format-UDP protocol with 56 bytes of header in the UDP portion for time code, etc., and 1024 bytes of data. The output SDDS packets are sent to a user-defined multicast address. Once in UDP/SDDS packet form, that data can be transferred over commercial network frameworks, then acquired into a host computer via a network port or via an ICE-PIC card using an SDDS I/O module.

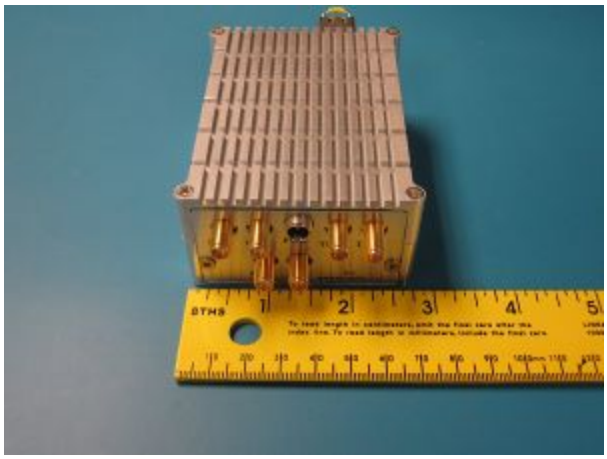
Features

- Offers data translation from A/D, ECL, to standard GigE UDP packets using the SDDS protocol
- Optionally, time code insertion can be added to the SDDS header to time stamp packets
- Dimensions 3.125" x 4" x 1.65" desktop unit
- Desktop unit powered from single 8V to 13V DC supply (2Amps)
- Data output is packetized as UDP/SDDS packets
- Maximum host transfer rate of 100 MBytes/sec
- Time code sources include IRIG for A/D conversion and embedded serial time code from ECL units
- Commonly available SFP module types are:
  - Copper "T" for use with copper wiring up to 100 meters
  - 850nm fiber "SX" for use with multi-mode fiber up to 550 meters
  - 1310nm fiber "LX" for use with single-mode fiber up to 10,000 meters
  - 1550nm fiber "ZX" for use with single-mode fiber up to 70,000 meters
  - 1310/1550nm "BX" single-optical fiber CWDM
- For A/D interface:
  - Production unit - SMA inputs
  - SMB/SMA connector for external clock ref derived via a comparator - AC-coupled 1Vp-p.
  - Oscillator socket or user supplied clock, software selectable with external comparator clock.
  - SMA to BNC cable 5ft. (P/N: ICE-CAB-SMA) Click here for Pricing
- For ECL, LVDS, and PECL interfaces:
  - Ribbon cable 5ft. (P/N: ICE-CAB-HD5) Click here for Pricing
- Available in 2- or 4-channel 1U chassis configurations with optionally installed high-gain tuners (see relevant section below for details)

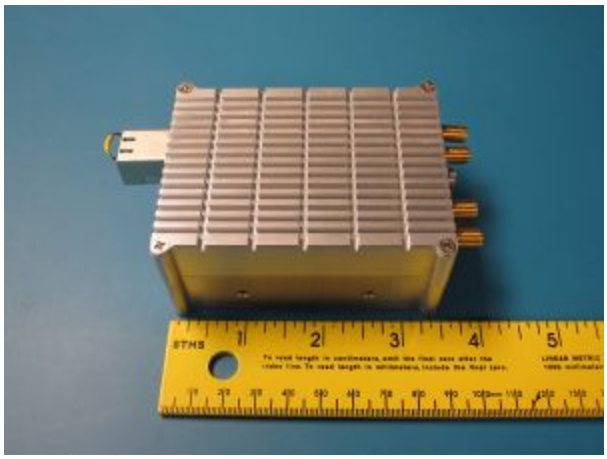
Note: The GigEXD requires an I/O module interface listed below for data-conversion operation.



GigEXD-r2 Top (2)



GigEXD-r2 Width



GigEXD-r2 Length

Applications

The applications for the GigEXD are directly dependent on the I/O modules which they incorporate, namely, either the A2D-r13-D or the DR2D-D. (See the I/O Modules section on this page.)

Operation

The GigEXD is programmable and configurable via its Gigabit Ethernet link. The module contains an IP address that is used for configuration or programming. A small C program is provided that will configure or program the module via a host system's Gigabit Ethernet port. Alternatively, configuration may be done using an ICE-PIC card and UDP/SDDS module that is connected to the same network framework that the GigEXD occupies.

Note: Configuration of the GigEXD may be done using an ICE-PIC card and UDP/SDDS interface module, but programming has not been implemented as of yet. At a later date, programming of the GigEXD via the ICE-PIC/SDD module interface will be available.

Once configured via ethernet, the device outputs data until reset or reconfigured. Many options are available during configuration including the use of timecode to "time stamp" packets. For A/D data, the timecode source takes the form of IRIG-B timecode that is converted inside the GigEXD to standard SDDS format and placed in packet headers. For digital modules, such as ECL, timecode is extracted from the serial stream of the data and converted to standard SDDS format and placed in the SDDS headers. Time stamping may also be turned off for simple data conversion with no SDDS timecode in the SDDS packet headers.

Configuration

As mentioned above, each GigEXD has its own IP and its own output multicast address. The IP address is used for setting Data Type parameters within the GigEXD: such parameters include timecode type, samples size (8-bit or 16-bit), and clock rate. Along with Data Type parameters, the GigEXD can have the multicast address to which it sends data changed. Finally, the IP address of the GigEXD may be changed to allow for multiple GigEXD units with unique IP and multicast addresses to operate in a single network framework.

On each GigEXD module, a "default button" is provided. This button, when pressed and held for 2 seconds, will return the GigEXD to its factory default IP address and multicast output address. This allows for the user to return a GigEXD to a known IP address for updating of configuration or programming, or if the configured IP address is lost or forgotten.

All configuration and programming is stored on the GigEXD in flash memory. This allows for data type configuration, IP addresses, and multicast addresses to remain through power cycles—whether the power cycles are intentional or not. Also, the use of flash memory to hold configuration means that a user can configure the parameters of the module, and these parameters are then in use until reprogrammed. Once configured, a GigEXD will run in its programmed mode until reconfigured. This allows for lower configuration cycles and maintenance.

Programming

The GigEXD contains onboard FPGAs, clock synthesizers, and EPROMs. As updates to the programming of these devices are made available (via ICE software tree downloads), the GigEXD can be "re-programmed" to take advantage of these updates over any network framework. In other words, the GigEXD receives its programming over Gigabit Ethernet. As new updates become available, updating the GigEXD is simply a matter of executing the C program to reprogram the device with these new features.

I/O Modules

The GigEXD has a modular I/O interface. I/O modules are "daughter boards" that are attached to the GigEXD motherboard to provide an electrical interface that is converted to Gigabit Ethernet UDP/SDDS data via the GigEXD motherboard. These interfaces include analog to digital conversion and differential line interfaces (LVDS, ECL, PECL, Differential LVTTL, etc.). The I/O modules that can be ordered with the GigEXD motherboard, assembled, and then shipped out as a complete unit are the A2D-r13-D and DR2D-D-r1.

Note: These are functionally equivalent to their standard ICE I/O module counterparts, namely the ICE-A2D-r13 and ICE-DR2D-r5, although their circuitry differs to accommodate their pairing with the GigEXD.

A2D-r13-D

Please see the ICE-A2D-r13 page for features and specifications.

DR2D-D-r1

Differential Receiver to Digital ICE-GigEXD-r2 Input Module

Note: More functional information is available on the ICE-DR2D-r5 page.

The ICE DR2D-D is a 16-bit data plus clock differential receiver module. The DR2D-D module receives differential signals (LVDS, Differential ECL, LVECL, PECL, LVPECL, etc.) and converts them to LVTTL level signals that can be processed by its GigEXD host. The features for the DR2D-D include the ability to convert any differential signals that have a common mode input voltage in the range of -4V to 5V into standard single-ended LVTTL signals. The DR2D inputs also have +/-50mV of input hysteresis and differential 100 Ohm termination. Input clock rates from 1MHz to 105MHz are supported. Data acquisition on either the rising or falling edge of the clock can be configured via the user software interface. Each unit comes with a 5-ft. cable with a mating IDC connector on each end. There are 3 options for use of this cable:

1. One end interfaces to the DR2D-D module, the other end can optionally be connected to a ICE, Inc., transition panel that allows for a direct connection to various connector types, such as SMS/ELCO, SDN/AMP 3x30, etc. Information on various connector transition panels can be found at www.ice-online.com
2. The user can remove (cut off) the 2nd IDC cable end and then solder on any connector they wish. **Note:** Data connections should be MSB aligned. (A wiring diagram is provided near the end of this document.)
3. By contacting ICE, Inc., we can provide cable assemblies to almost any type of connector. Call for an NRE quote/lead time.

Features

- Uses differential data converters
- 16-bit data plus clock
- -4V to 5V common module input voltage
- Supports multiple differential logic inputs
    1. LVDS
    2. Differential LVECL, ECL
    3. Differential LVPECL,PECL 4, differential LVTTL

Applications

- Digital data to Gigabit Ethernet transformation
- Digital data to SDDS transformation
- Digital data time stamping
- Single-channel digital receivers

Software

Note: As of version 2.0 of the GigEXD software and firmware, the GigEXD-r1 (rev 1) is no longer supported. Software and firmware support for the GigEXD-r1 ended with version 1.9. The GigEXD-r2 contains more sophisticated circuitry that allows for faster and larger data manipulation.

A simple C program is used to program the GigEXD via a host computer's network port. A Linux build script is included with the software. Currently, the GigEXD software zip package gigexdvA_B.zip, (where A and B represent the major and minor version numbers of the associated GigEXD software package) resides in the ICE downloads directory (https://downloads.ice-online.com/).

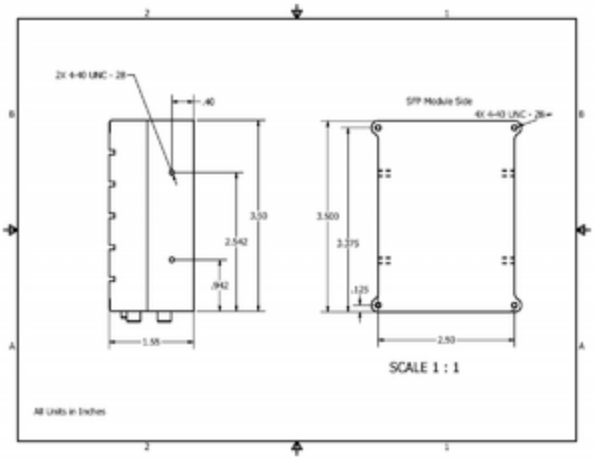
Documentation

Below is the GigEXD User Guide. Incorporated into the User Guide is a 1-page "Quickstart" document for first-time users. The User Guide (and Quickstart) is also available as part of the software/firmware zip package for download (see above). The User Guide is a comprehensive document for first-time and advanced users.

GigEXD Rev2 User's Guide Version 2.20 (https://downloads.ice-online.com/datasheets/GIGEXD_User_Guidev2_20.pdf)

Mechanical

Both the prototype and production units come with screw holes on the bottom for mounting. The prototype unit comes with an internal fan for cooling. The production unit does not have an internal fan; rather, its internal circuitry is cooled by conduction to its metal housing.



Mechanical Drawing

Specifications

Input Voltage	7-18 Volts, 12 Volts nominal
Input Power	12 Watts maximum, 10 Watts nominal
Power Connector	Switchcraft 712RA
Mating Connector	Switchcraft 760K
Dimensions w/o SFP	88.9 x 66.04 x 39.37 mm (3.5 x 2.6 x 1.55 in.)
Dimensions w/ SFP	107.95 x 66.04 x 39.37 mm (4.25 x 2.6 x 1.55 in.)
Weight	0.389 kg (0.855 lb)
Operating Temp	0°C-40°C (32°F-104°F) ambient
Operating Humidity	90% maximum relative humidity, non-condensing

Statement Of Volatility

The GigEXD contains internal volatile RAM memory and one external FLASH EPROM. The external flash EPROM holds the GigEXD programming and configuration between power cycles. The internal RAM memory holds user data while it is being processed until sent out over Gigabit Ethernet via UDP/SDDS protocols. Removing power erases ALL user data held in the GigEXD. The flash EPROM never holds user data but can be cleared for sanitization by executing the `prgclrcfg` command using the GigEXD C program (see User Guide above). Using the prgclrcfg command will erase the flash EPROM configuration and programming, and then restore its factory programming; therefore, sanitization of the GigEXD is a 2-step process.

1. Perform the `prgclrcfg` command.
2. Upon finishing the `prgclrcfg` command, remove power from the GigEXD.

Once steps 1 & 2 are completed the GigEXD is sanitized. The link below will provide you with the above information in PDF format.

Sanitization PDF (https://downloads.ice-online.com/datasheets/GIGEXD_Sanitization.pdf)

Rack-mount Configurations

The following multi-channel GigEXD 1U rack-mount chassis configurations are detailed below.

- Option 1: No tuners
- Option 2: ZTuner receivers (up to 4)
- Option 3: DRS SI-8614 Nanoceptor™ receivers (up to 4)

ICE-1U-GigEXD-2C

- 1U form factor chassis with 2 GigEXD channels
- Redundant power supplies
- One external IRIG timecode connection for timecode to all 4 internal GigEXD units—internal 1-to-2 timecode signal distribution system
- Internal mounting brackets for up to 2 DRS SI-8614 Nanoceptor™ receivers, 2 ZTuner receivers, or mix/match of both (external analog connections at rear of chassis)
- Internal 1:4 Digi PortServer® for 100BaseT-to-serial conversion for communication to above receivers. All cabling (serial cables, ethernet cable) included. External 100BaseT connection on back of unit for Digi communication
- Integration of GigEXD units included, receiver integration done by user (all appropriate cabling for connections included inside of chassis)
- One-year warranty

ICE-1U-GigEXD-4C

- 1U form factor chassis with 4 GigEXD channels
- Redundant power supplies
- One external IRIG timecode connection for timecode to all 4 internal GigEXD units—internal 1-to-4 timecode signal distribution system
- Internal mounting brackets for up to 4 DRS SI-8614 Nanoceptor™ receivers, 4 ZTuner receivers, or mix/match of both (external analog connections at rear of chassis)
- Internal 1:4 Digi PortServer® for 100BaseT-to-serial conversion for communication to above receivers. All cabling (serial cables, ethernet cable) included. External 100BaseT connection on back of unit for Digi Communication
- Integration of GigEXD units included, receiver integration done by user. (All appropriate cabling for connections is included inside of chassis.)
- One-year warranty

Status and Configurations

This model is in production. For pricing, please see the Pricing page.

The GigEXD-r2 is available as a unit, or integrated into a multi-channel 1U chassis with 2 or 4 units (see above section).

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