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SHAPING THE FUTURE OF

DATA ACQUISITION



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SHAPING THE FUTURE OF DATA ACQUISITION

ICS modular products for high performance data acquisition and the FPDP data flow concept have truly revolutionized real-time acquisition, archiving, processing and analysis of analog signals. These products not only offer a quantum jump in performance, but they have also reduced the cost of ownership immensely.

It is now possible to integrate virtually any number of analog channels of any bandwidth up to several MHz for real-time applications. ICS offers both board-level (VMEbus and PCI Bus) and system-level solutions. ICS SYSTEM-1000 fully-integrated data acquisition solution is built to user specifications and delivered in 30 days. The price of a system is typically less than $500 dollars / channel, as it runs right out of the box.



- **Control from any Personal Computer**
- **Simultaneous sampling on all channels**
- **Over 500 channels in one 19” rack-mountable enclosure, only 12" high**
- **Bandwidths from DC to several MHz**
- **Programmable signal conditioning and gain**
- **16- or 24-bit acquisition, offering a large dynamic range (up to 110dB)**
- **Near perfect phase- and gain-matching across all channels**
- **Full programmability of individual channel bandwidth with digital filtering**
- **Analog output of any number of channels**
- **Complete diagnostics**
- **Real-time data recording in any medium of user choice (RAID, SCSI, Tape, etc.)**
- **Direct interfacing of data to PC via Ethernet or high speed FPDP**
- **LabVIEW and MATLAB interfaces for data analysis**

When it comes to acquisition, archiving, processing and analysis of a large number of wide bandwidth signals, there is no better technical, or more cost-effective solution, than ICS off-the-shelf data acquisition products.

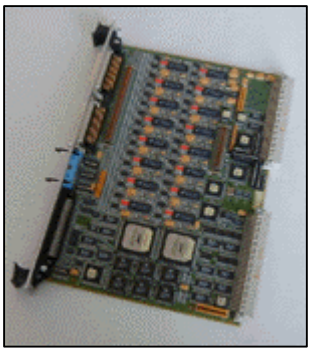
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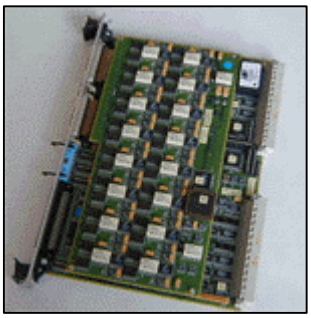
HOW DO WE DO IT?

- ***Any number of channels and any bandwidth***

For bandwidths up to 40 kHz, ICS offers the ICS-110B VMEbus board (the PCI Bus version is the ICS-610), which includes 32 differential input channels, 24-bit Sigma-Delta ADCs, 110 dB SNR, and simultaneous sampling at rates up to 100 kHz/channel. Signal conditioning is available on a daughter card (still occupying only one card slot) which offers 2-pole anti-alising filters (consistent with the Sigma-Delta ADC requirement) and gain of up to 31.5 dB in steps of 0.5 dB.



ICS-110B 32-ch. 24-bit Sigma-Delta ADC board with 100 kHz/ch. simultaneous sampling
(Download Tech Note 24A)



ICS-110B1board includes signal conditioning Daughter Card with programmable gain
(Download Tech Note 24A)

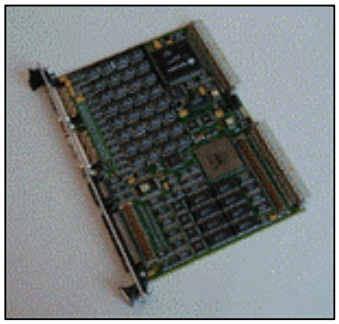
For bandwidths up to 573 kHz, ICS offers the ICS-130 VMEbus board, which includes 32 differential input channels, 16-bit Sigma-Delta ADCs, 90 dB SNR and simultaneous sampling at rates up to 1.2 MHz/channel. Two signal conditioning options are available, the ICS-121 and ICS-131 boards. The ICS-121 offers –12dB to 42 dB gain in steps of 6dB with 3-pole filters and an operating bandwidth of up to 300 kHz. The ICS-131 offers –12dB to 36 dB gain in steps of 6dB with 4-pole filters and an operating BW of over 570 kHz.



ICS-121 32-ch. signal conditioning and gain board with bandwidth of up to 300 kHz
(Download Tech Note #29)



ICS-131 32-ch. signal conditioning and gain board with bandwidth of up to 570 kHz
(Download Tech Note #34)



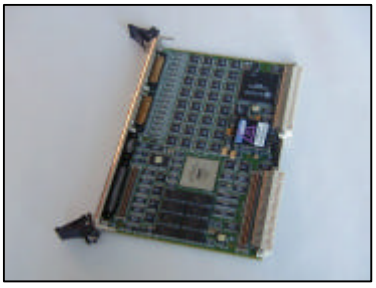
ICS-130 ADC 32-ch. 16-bit Sigma-Delta ADC board with 1.2 MHz/ch. simultaneous sampling
(Download Tech Note #25)

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For bandwidths up to 1 MHz, ICS offers the ICS-145 VMEbus board (the PCI Bus version is the ICS-645) which includes 32 input channels, 16-bit oversampling ADCs, 90 dB SNR and simultaneous sampling at rates of up to 2.5 MHz/ch. The board also supports sampling rates of 5 MHz (for up to 16 channel) and 10 MHz (for up to 8 channels) with slightly reduced dynamic range. Signal conditioning is provided by the ICS-141 board, which includes 4-pole anti-aliasing filters and -12dB to 36 dB gain in steps of 6 dB



ICS-141 32-ch. signal conditioning and gain board with bandwidth of up to 1 MHz
(Download Tech Note #35)



ICS-145 32-ch. 16-bit oversampling ADC board with 2.5 MHz/ch. simultaneous sampling
(Download Tech Note #32)

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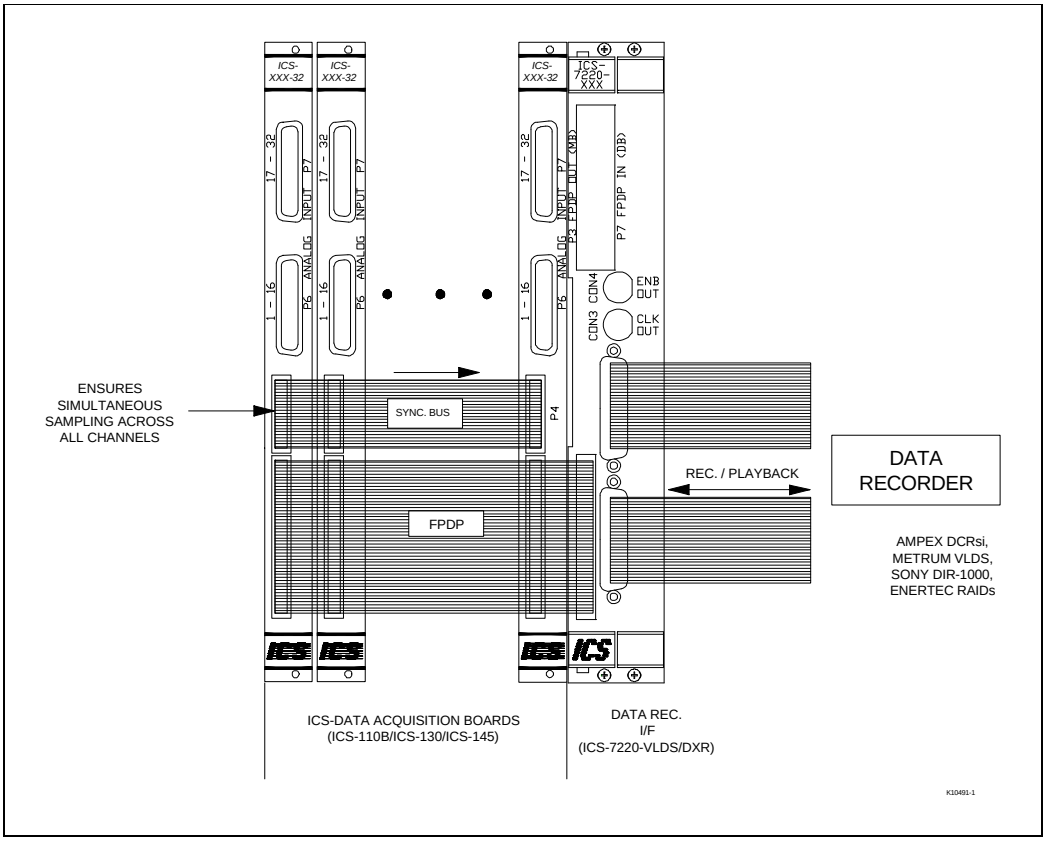
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Building a real-time data acquisition system has never been easier. Select the right board type(s) for the given signal bandwidth and signal conditioning requirements and use the appropriate number of boards for the required number of channels. For example, a 512-channel data acquisition system with up to 40 kHz bandwidth requires only16 ICS-110B1 boards (ICS-110B with signal conditioning daughter card). The ICS boards include front-panel synchronizing signals to ensure simultaneous sampling across all channels. ICS pioneered the FPDP (Front Panel Data Port) data flow concept which allows the boards to be bussed over a ribbon cable to move all 512 channels of ADC data over a ribbon cable at a sustained 160 Mbytes/s rate. No real-time software to write, no bus bandwidth bottleneck and no latency.

- ***Data Archiving to Any Medium***

Archive real-time ADC data to any medium: digital data recorders, RAIDs, FiberRAIDs, DLTs or whatever you prefer. The ICS-7220-XXX series products support virtually all popular digital data recorders including Metrum Buffered VLDS, Ampex DCRsi, Sony DIR-1000, Enertec DV6xxx, DV5830, etc. The use of FPDP ensures that the speed is only limited by the recorder. All ICS products support both record and playback.

ICS FPDP partners provide products for high-speed recording of FPDP data using the fast (up to 100 Mbytes/s) FiberRAID recorders. Recording to SCSI devices can also be supported via the embedded processor.



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- ***Real-Time Digital Filtering & Demodulation***

In many data acquisition system it is often required to handle multiple bandwidth signals and/or IF signals that require digital FIR filtering and decimation and/or complex demodulation for data rate reduction. The ICS-2200D card is an ideal multi-channel front-end DSP card that offers up to 640 MOPs (320 Mtaps/s) of sustained computing power, full 24-bit arithmetic precision, and real-time update of parameters.

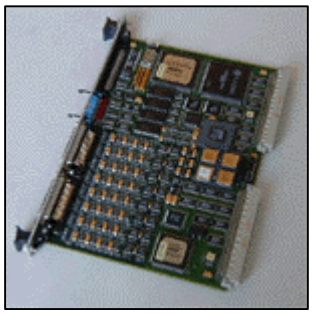


ICS-2200D Front-end DSP Board
(Download Tech Note #9 and #10)

- Multiple FPDP ports for data I/O
- 640 MOPs of sustained computing power
- Full 24-bit precision (24-bit data and coeff. & 60-bit arithmetic)
- Real-time update of parameters
- Synchronized operation with multiple boards

- ***Analog Output***

For transmit, simulation or monitoring applications, the ICS-115 analog output board offers up to 32 differential outputs using 16-bit Delta-Sigma DACs. The board supports up to 45 kHz bandwidth for each of the 32 channels and requires no post filtering. Any number of boards can be operated in parallel. The front panel Sync. Bus ensures that all DACs are updated simultaneously. The board provides 90 dB SNR. The new ICS-116 32-ch. DAC board will support update rates up to 400 kHz/ch (bandwidth of 180 kHz).



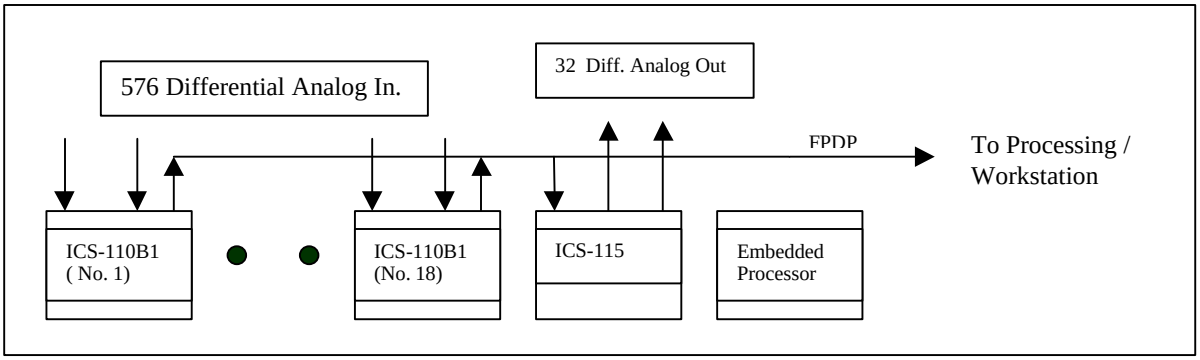
ICS-115 32-channel, 16-bit Delta-Sigma DAC board
(Button for download)

A 576-channel signal conditioning, data acquisition and monitoring system can now be incorporated in a single 20-slot VME enclosure. The ICS-115 can output any 32 of the 576 inputs for monitoring

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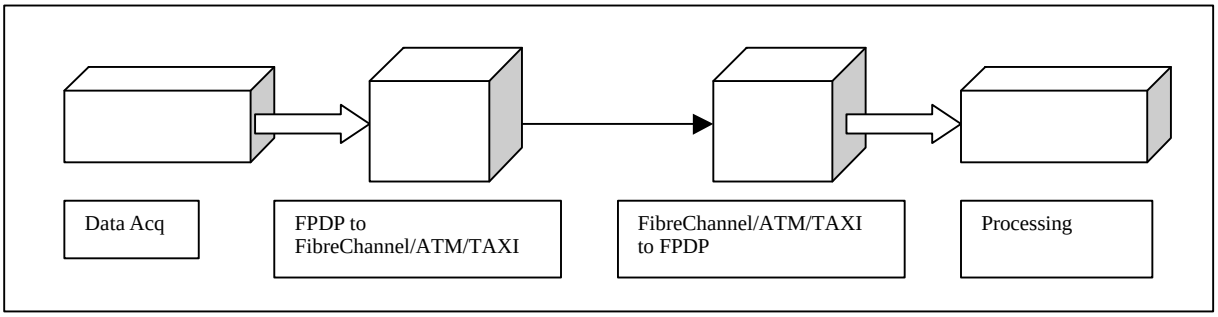
- ***Remote Data Acquisition and Interface to PCI***

The FPDP standard pioneered by ICS has simplified integration of real-time sensor processing systems. The data flows freely on a ribbon cable and no time-critical software is required to be developed to manage the data flow. The third party support for FPDP has grown steadily. Just about every conceivable function is now available with full FPDP support.



Recently, a number of products have been introduced that provide FPDP to fiberoptic cable interfaces. Systran Corp. of Dayton, Ohio have introduced the FiberExtreme product. This FPDP to FiberChannel card supports a data rate of 100 Mbytes/s over distances of up to a 10 km when using single mode fiber. At the receive end, the board can recover the sampling clock (FPDP frame frequency). This is important when running DACs or other sample clock dependent processing functions. Planning System Inc of Long Beach, MS provide products for FPDP to ATM and FPDP to TAXI translation. These also provide sample clock recovery.

Translation of FPDP signals to PCI Bus is also available using products from several vendors. VMETRO A/S provides the DPIO product, a PMC format module that provides interface from FPDP to PCI in either direction. Echotek Inc. of Huntsville, AL, have also announced a similar product. these products allow FPDP data streams to be connected to PCI Bus devices in other chassis including Personal Computers.



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- ***Fully-Integrated Solution***

A fully-integrated real-time data acquisition solution from order to delivery in 30 days? Hard to believe, but ICS modular building blocks and the FPDP data flow concept have made this possible. We routinely deliver our SYSTEM-1000 solution integrated and tested to a user requirement, at a catalog price, and in 30 days. What's more, our technologies have brought the cost of analog signal acquisition down to less than $500 dollars/channel, signal conditioning and data recorder interface included.

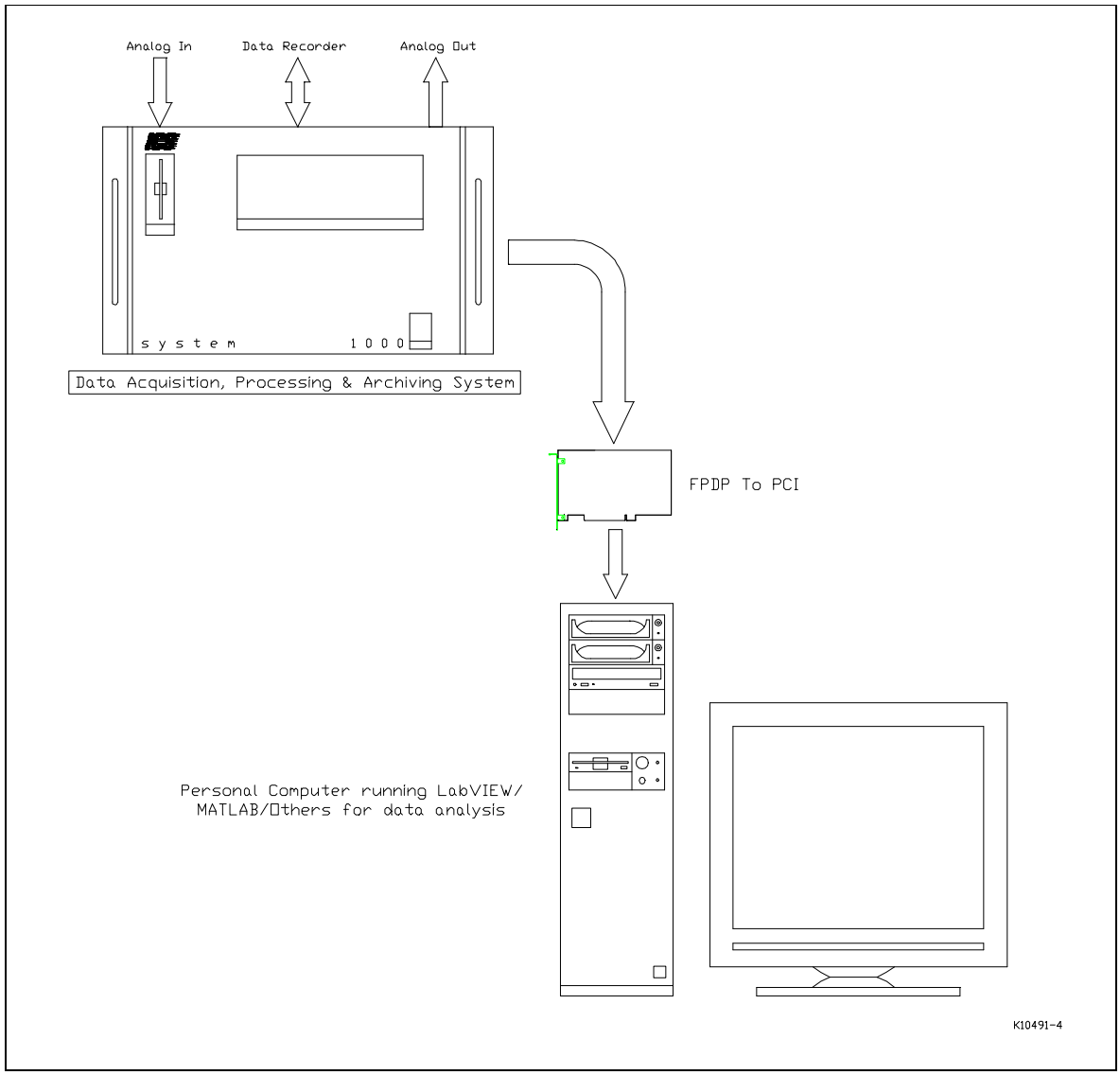


Just specify the number of channels, channel bandwidth, type of data recorder, etc., and we will send you a system configuration and a price quotation that will knock your socks off!

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- ***Data Analysis Using Off-The-Shelf Software***

Using the FPDP to PCI Bus link, one can now transfer raw or processed ADC data to a Personal Computer at rates in excess of 100 MBytes/s. Once the real-time data is available in the PC, any popular data analysis/DSP software (such as LabVIEW, Matlab, etc.) can be used for signal analysis. ICS routinely delivers sonar receive, transmit, sim/stim and other real-time signal analyzer products using the popular LabVIEW software. ICS also offers LabVIEW support for the VMETRO FPDP to PCI card.



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