BitBox

The BitBox is BitFlow's new solution for high density I/O applications. Many machine makers require a large number of computer managed I/O signals for continuous control of the system state. This includes controlling devices such as strobes, solenoids, actuators, indicators, switches, encoders, and triggers, as well as gathering inputs from photo-detectors. In general, BitFlow frame grabbers come with a fairly large number of inputs and outputs, but for some systems this is simply not enough. Most customers end up purchasing another device to manage the I/O which adds expense, requires another slot, another driver and SDK, another manual, etc. The BitBox has been designed for just this situation. It is controlled completely from the frame grabber and uses the same API, driver, and manuals as the frame grabber. This saves time, money, and space. It is also straightforward and easy to use.

The BitBox Concept

Traditional I/O cards put all of the transmitters and receivers on the actual board in the PC. This requires bringing all of the I/O wires from their sources to the PC, which is often located quite a distance from other equipment. With the BitBox, all the transmitters and receivers are located right in the BitBox, on the rail, close to the other equipment. Control is facilitated by a small high speed cable which goes between the BitBox and the frame grabber. This cable can be up to 10 meters in length, providing maximum flexibility in positioning equipment inside the machine.

Maximum Flexibility

BitFlow knows that the typical machine builder's design needs to interface with all kinds of equipment. The BitBox has been modeled with just this type of appllication in mind: TTL, LVDS, Open Collector, Opto-Isolated, and 24 Volt signaling levels are all supported.

Another common issue is that there are never enough of any given type of I/O pins. Again, the BitBox has this problem covered by providing 36 inputs and 36 outputs, all of which can operate simultaneously.

Easy to Deploy

The BitBox has been designed to simplify integration into your manufacturing process. Each block of 12 pins (logically grouped by signal type) has a separate connector. We use high quality non-screw type connectors. A small tool is used to insert/release a bare wire into the block connectors. Each block can be added or removed easily and quickly while locking securely in place for factory floor reliability. What all of this means is that you can fabricate your harness without having to directly wire the BitBox. Once the harness is laid out in your machine, it is easy to snap the BitBox onto the rail and snap all the block connectors in place.
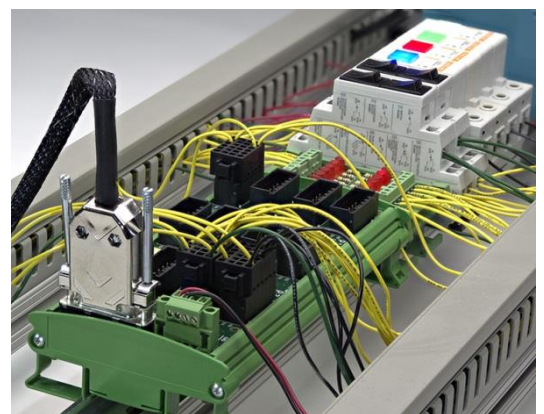
Of couse, should the BitBox ever fail (unlikely given its robust components) it is quick and easy to replace - no tools needed.

Signal Types

All of the outputs on the BitBox can be driven either to static level (via software API and/or configuration files) or from one of the frame grabbers internal signal generators. The signal generator is both flexible and accurate and can generate sophisticated wave forms with 100 nanosecond precision. Triggers can be used to generate one or more pulses of varying size.

The inputs from the BitBox can be routed to a number of different blocks on the frame grabber. The level of any input can be read at any time via software. In addition, these signals can be routed to other outputs or to a camera; they can also cause an interrupt, start acquisition, end acquisition etc. The list is quite endless. Suffice it to say that the BitBox was designed for maximum flexibility.

Of course, frame grabbers are all about working with cameras, which require triggers and encoders. Thus, any input can be a camera trigger or encoder. Quadrature encoders are also supported.

Power

The BitBox can be powered directly from a source on the rail, or it can be powered from the PC (using the same small cable that is carrying the signals to/from the frame grabber). This latter situation is useful when the BitBox is located in a position that does not have access to a local power source.

Locating

The BitBox can be located anywhere in your system. Only a small 15 wire cable needs to go between the frame grabber (in a PC) and the BitBox. BitFlow can provide these cables in various lengths or you can build your own. One advantage of this arrangement is that the high voltage signals are never brought into the PC. This isolation also adds electrical decoupling from noisy signals.
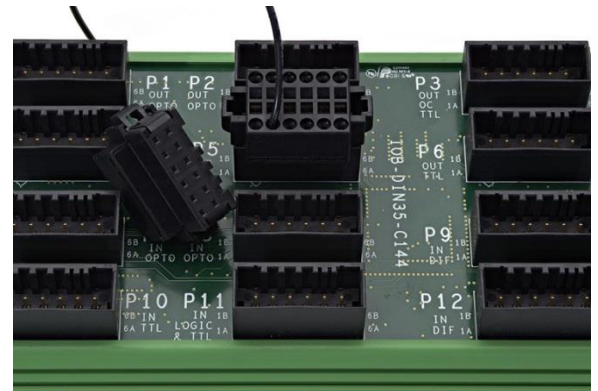
Specifications

- 36 inputs, 36 outputs
- 12 TTL inputs, 12 TTL outputs
- 12 differential inputs, 12 differential outputs
- 8 Opto-isolated input, 8 Opto-isolated outputs
- 4 high voltage inputs (12 to 24 V), 4 high voltage outputs (Open Collector - 3.3 to 24V)
- Input level can be read by software
- Inputs can be routed to the acquisition engine, Timing Sequencer trigger, camera, outputs
- Outputs can be static (software controlled), dynamic (from the Timing Sequencer), source from other intputs
- DIN-35 Rail mountable
- LEDS indicate power, input activity, output activity
- Pins grouped in blocks of 12 signals, each block of 12 has its own connector
- Many different cabling options supported from frame grabber to BitBox
- Cables can be purchased from BitFlow or customer manufactured (simple connectors used through out)
- Power requirements 5 to 24 VDC

Model

IOB-ISO35-C144
- 36 Inputs
- 36 Outputs
- DIN-35 Rail
BitFlow SDK 6.3 or later required