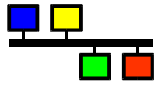
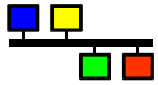


EPICS



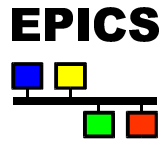
Supported Hardware

Andrew Johnson
APS



How Can I Find Device Support ?

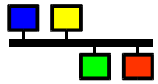
- ◆ Supported Hardware Database on website
- ◆ EPICS Collaboration Meetings
- ◆ Google search
- ◆ tech-talk archive search
- ◆ tech-talk mailing list
- ◆ BUT most support available is for vxWorks and R3.13.x
 - ◆ Converting to R3.14.x is not hard, another OS may be much harder



Ways To Support Your Hardware

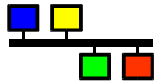
- ◆ Instrument Specific Device Support
 - ◆ Write a device support module (e.g. devHp54520.c) that is specific to that instrument/device
 - ◆ All protocol is hidden from users.
 - ◆ Easy to handle device peculiarities

- ◆ Generic Support
 - ◆ Provide device specific information in the database
 - ◆ Special field in a custom record
 - ◆ Parm field of I/O Link



Popular Hardware

- ◆ VME
 - ◆ Many modules available
 - ◆ Generic VME Record - allows simple devices to be used w/o device support
 - ◆ Generic A16/D16 device support
 - ◆ Specify register offset and bit field in I/O link
- ◆ VXI
 - ◆ Resource Manager (drvVxi)
 - ◆ Automatically configures MXI Modules to support multiple crate systems. Hierarchies allowed.
 - ◆ Static and Dynamic Addressing Supported
 - ◆ A24/ A32 Address Allocation
 - ◆ Libraries provide ...
 - ◆ lookup modules based on Logical Address, slot, Make, or Model
 - ◆ exclusive access to a device for a single driver
 - ◆ core routines for Message Passing Devices



Popular Hardware (cont.)

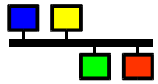
◆ GPIB

◆ Hardware

- ◆ HP-2050A Ethernet-GPIB Bridge
 - ◆ Should be usable with R3.14.x from any OS
- ◆ NI1014 VME card
- ◆ IP-488 IndustryPack module (using Message Passing Facility)
 - ◆ Marty Kraimer has a working Linux driver for this module

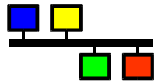
◆ Instrument Specific Device Support

- ◆ Template device support routine available
 - ◆ Edit parameter table which specifies command strings and parsing format for each supported function – see next slide...
- #### ◆ Generic GPIB Record - allows simple communications without having to write specific device support
- ◆ Use with stringCalc record to create/parse strings
- #### ◆ GPIB Interact utility allows menu driven interaction with devices



Popular Hardware (cont.)

```
static struct gpibCmd gpibCmds[] =
{
  /* Param */
  /* 0 */ FILL,
  /* 1 : set frequency : AO */
    {&DSET_AO, GPIBWRITE, IB_Q_HIGH, NULL, "FA %.3f", 0, 20, NULL, 0, 0,
    NULL, NULL, -1},
  /* 2 : read frequency : AI */
    {&DSET_AI, GPIBREAD , IB_Q_HIGH, "SEND FREQ", " F OUT %lf", 0, 20,
    rdCheck, 0 ,0, NULL, NULL, -1},
  /* 3 : set output level : AO */
    {&DSET_AO, GPIBWRITE, IB_Q_HIGH, NULL, "LEVEL %.1f", 0, 20, NULL, 0,
    0, NULL, NULL, -1},
  /* 4 : read output level : AI */
    {&DSET_AI, GPIBREAD , IB_Q_HIGH, "SEND POWER", " P INT %lf", 0, 20,
    rdCheck, 0 ,0, NULL, NULL, -1},
  /* 5 : read LOCK status : BI */
    {&DSET_BI, GPIBREAD , IB_Q_LOW, "SEND STATUS", " LOCK %lu", 0, 30,
    NULL, 0 ,0, NULL, NULL, -1},
  /* 6 : read LEVEL status : BI (if LOCK status != 1, this read will fail */
    {&DSET_BI, GPIBREAD , IB_Q_LOW, "SEND STATUS", " LOCK 1 LEVEL %lu",
    0, 30, NULL ,0 ,0, NULL, NULL, -1}
};
```



Popular Hardware (cont.)

◆ Serial

◆ Hardware

- ◆ Serial ports on CPU board
- ◆ IndustryPack serial port modules

◆ Device Support

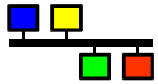
- ◆ There are several different serial device support layers available
 - ◆ drvSerial, drvAscii, devAscii
 - ◆ Message Passing Facility
 - ◆ Streams
 - ◆ ORNLSerial

- ◆ These differ in ease of use and complexity of serial protocol they support

◆ Generic Serial Record - allows simple communications (via MPF?)

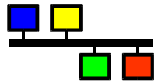
without having to write specific device support

- ◆ Allows serial port configuration on the fly
- ◆ Use with stringCalc record to create/ parse strings



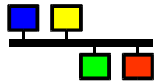
Popular Hardware (cont.)

- ◆ Allen Bradley
 - ◆ VME Scanner (Remote I/O or “Blue Hose”)
 - ◆ 1771 Series I/O Adapters
 - ◆ 1791 I/O
 - ◆ 1771-DCM (mailbox to PLC)
 - ◆ SLC500-DCM (mailbox to PLC)
 - ◆ Serial port to PLC serial port
 - ◆ Access to any element in PLC
 - ◆ AB DataHighway +
 - ◆ Access to any element in PLC



Popular Hardware (cont.)

- ◆ PLC Interfaces
 - ◆ AllenBradley PLC5 via 1771-DCM
 - ◆ 10 messages of 64 words each from PLC
 - ◆ 1 message of 64 words to PLC
 - ◆ Device support fetches info from DCM record, which holds all the data from the DCM
 - ◆ AllenBradley via SLC500 DCM
 - ◆ Uses a message of 8 words for reading/writing
 - ◆ GE Fanuc
 - ◆ PLC dumps a serial stream to the IOC
 - ◆ PLC Direct (Koyo)
 - ◆ DL240/DL250 CPUs using DirectNet
 - ◆ IOC can read the entire PLC memory map
 - ◆ IOC can write to a designated memory block (512 words)
 - ◆ Modbus+
 - ◆ Device support for ioc [KEK]
 - ◆ CA Server on a PC talking to Modicon 984 PLC's via Modbus+ [MSU Cyclotron Lab]



Popular Hardware (cont.)

- ◆ CAMAC
 - ◆ Hytec Serial Highway Driver (VME)
 - ◆ Generic CAMAC Record - allows simple communications w/o device support

- ◆ Bitbus
 - ◆ Two VME boards supported

- ◆ CANbus