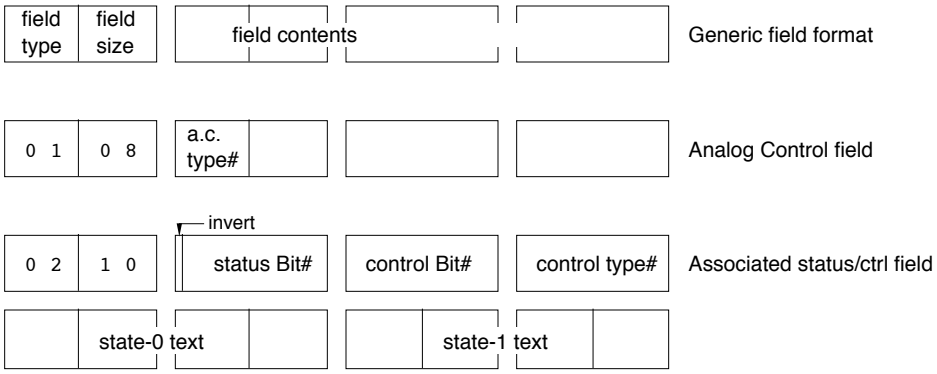
SSDR Formats for Linac

Acnet database download scheme

Thu, Dec 10, 1998

DL_LINAC field formats in SSDR

12/1/94




```
Field type codes:
FT_ACTRL = 1   Analog control field
FT_ASCTL = 2   Associated stat/ctrl
FT_CONVF = 3   Conversion flags
FT_FAMLY = 4   Family word
```

```
Analog control type codes:
AC_NONE   = 0   No analog control
AC_DATEL  = 1   Datel D/A board (obs.)
AC_MOTOR  = 2   Motor control
AC_BIPOL  = 3   Bipolar mpx D/A (Linac)
AC_UNPOL  = 4   Unipolar mpx D/A (Linac)
AC_MEMBY  = 5   Memory word (byte writes)
AC_T8253  = 6   Intel 8253 timer (obs.)
AC_T6840  = 7   Motorola 6840 timer (obs.)
AC_1553B  = 8   1553 interface 12-bit D/A
AC_AD602  = 9   Analog Devices RTI-602 D/A
AC_MEMWD  = 10  Memory word (word write)
AC_MSGQ   = 11  Message queue setting for other cpu
AC_UNSGN  = 12  Unsigned 12-bit D/A
AC_PV904  = 13  Burr-Brown MPV904 12-bit D/A
AC_1553W  = 14  1553 interface 16-bit D/A
AC_T9513  = 15  AMD9513 timer (32-bits pair of chans)
AC_MEMB1  = 16  Memory byte 1 byte (no shift)
AC_MEMBS  = 17  Memory byte 1 byte (I/O space, shift)
AC_DUMMY  = 18  Sets both reading and setting fields
AC_SRM12  = 19  SRM 12-bit D/A
AC_SRM16  = 20  SRM 16-bit D/A or timer
AC_IRM12  = 21  IRM D/A with offset, 4-bit right shift
AC_IRMNS  = 22  IRM D/A with offset, no shift
```

```
Control type codes (hi byte):
CT_NONE   = 0   No digital control
CT_TOGGLE = 1   Toggle bit
CT_SETHI  = 2   Set bit hi
CT_SETLO  = 3   Set bit lo
CT_PHI    = 4   Pulse bit hi (single, sft)
CT_PLO    = 5   Pulse bit lo (single, sft)
CT_P2HI   = 6   Pulse bit hi (pair, sft)
CT_P2LO   = 7   Pulse bit lo (pair, sft)
CT_HPHI   = 12  Pulse bit hi (single, hdw)
CT_HPLO   = 13  Pulse bit lo (single, hdw)
CT_HP2HI  = 14  Pulse bit hi (pair, hdw)
CT_HP2LO  = 15  Pulse bit lo (pair, hdw)
```

Here, "sft" or "hdw" means that software or hardware timing determines the pulse length, respectively. The control type itself is in the hi byte of the control type word. All software pulse types require the pulse length in #cycles to be specified in the lo byte. Control type codes 8-11 are unused.

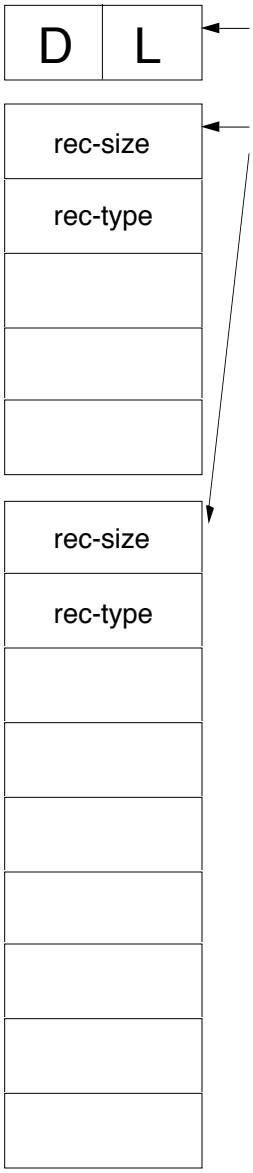
```
Conversion flags (hi byte):
CV_NONE  = 0  No flags set
CV_CAPT  = 2  Capture data
CV_ZERO  = 4  Zero-data
CV_GRAD  = 8  Gradient nonlin
CV_POWR  = 9  Power nonlin

Conversion flags (lo byte):
(unused)
```

prDNLD generic format

12/1/94

Note: Data formats shown in *words* for byte-order neutrality. All field sizes should be an even #bytes to preserve word-alignment.



Key to distinguish from other uses of SSDR besides prDNLD. Ascii 'DL' = $444C.

Records of downloading information. The rec-type identifies the record type. The size word is the *even* record size in bytes, including the rec-type and size words.

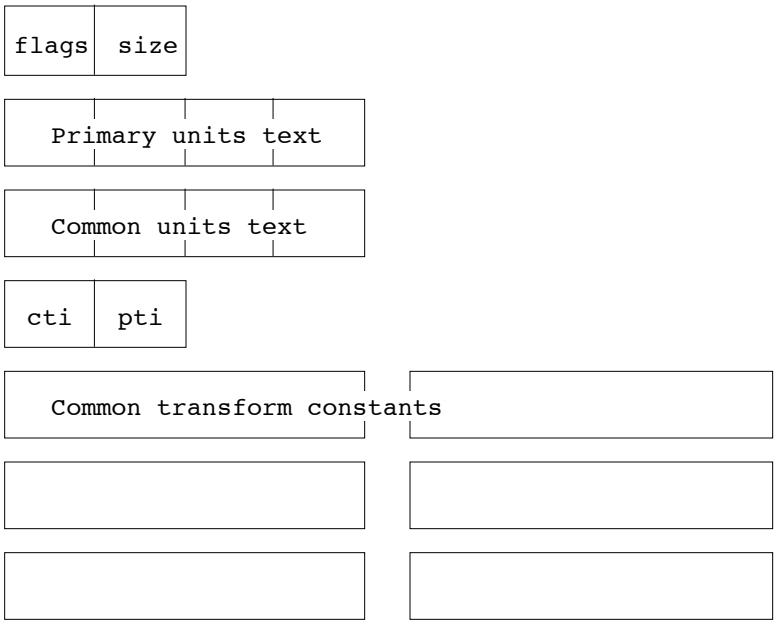
Examples of record types needed are:

```
DL_RECLST = 1   List of record types to download
DL_DVNAME = 2   Device name
DL_RDTXT  = 3   Descriptive text
DL_RDPDB  = 4   Reading PDB
DL_SETPDB = 5   Setting PDB
DL_BSPDB  = 6   Basic status PDB
DL_BCTRL  = 7   Basic control PDB
DL_ANABLK = 8   Analog alarm block
DL_DGABLK = 9   Digital alarm block
etc.
DL_LINAC  = 128 Download info for Linac-type stations
DL_xxxxx  = 129 Download info for xxxxx-type stations
etc.
```

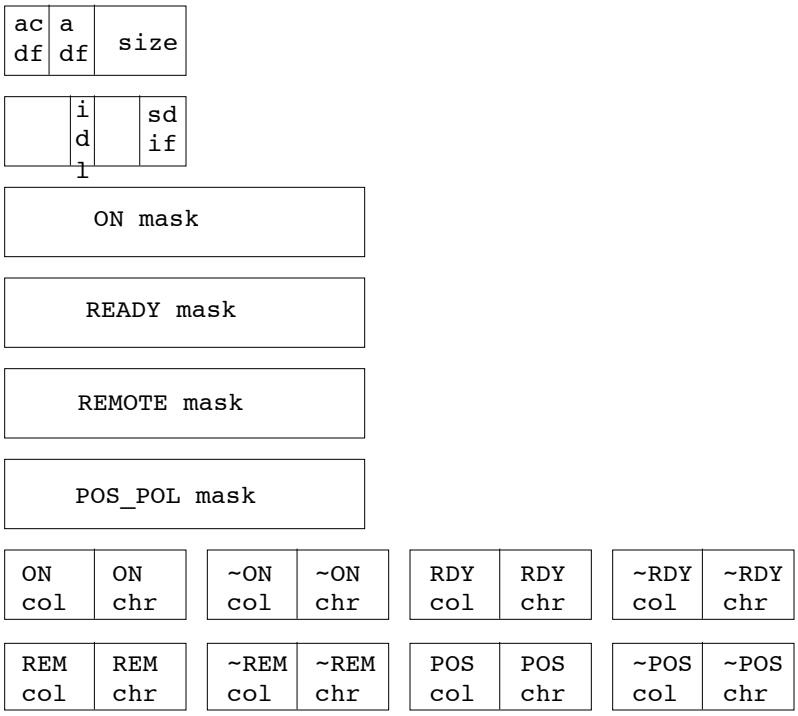
Formats of downloaded record types are as described elsewhere in Acnet design documents.

The 'DL' key, the record containing record types to download, and the record of front-end-private download info comprise the SSDR record when using this scheme.

Reading, setting PDB formats



Basic Status property PDB format



Example DNLD property for device **L:TO3IN** 12/1/94

```
444C          'D' in hi byte,'L' in lo byte

000C          Size = 12
0001          DL_RECLST List of record types record
0080          DL_LINAC  Linac private record
0002          DL_DVNAME Device name record
0003          DL_RDTXT  Device text record
0004          DL_RDPDB  Reading PDB record

0008          Size = 8
0080          DL_LINAC  Linac private record
0304          Conversion field, 4 bytes
0400          (Marked for zero-subtraction)
```

SSDR contents for device L:TO3IN

```
000C          Size = 12
0002          DL_DVNAME Device name record
3A4C          'L:TO3IN '
4F54
4933
204E

001C          Size = 28
0003          DL_RDTXT Device text record
3354          'T3 TOROID IN            '
5420
524F
494F
2044
4E49
2020
2020
2020
2020
2020
2020

0028          Size = 40
0004          DL_RDPDB Reading PDB record
0124          Flags in hi byte, PDB length=36 in lo byte
4F56          'VOLT' Primary units text
544C
414D          'MA  ' Common units text
2020
0202          Common xfm = 2 in hi byte, Primary xfm = 2 in lo byte
43C8          C1 = 100.0
0000
4220          C2 = 10.0
0000
0000          C3 = 0.0
0000
0000          C4 = 0.0
0000
0000          C5 = 0.0
0000
0000          C6 = 0.0
0000
```

Note that data formats for Acnet standard properties conform to that used in Acnet. All floating point 32-bit values are in DEC's format. All text is in Vax byte order. Data formats for front-end specific SSDR contents depend upon the front end, as the Vax does not interpret this——except for the user-friendly device entry program.

Example SSDR for device **L:QPS301**

12/1/94

```
444C            'D' in hi byte,'L' in lo byte

000E            Size = 14
0001            DL_RECLST List of record types record
0080            DL_LINAC  Linac private record
0002            DL_DVNAME Device name record
0003            DL_RDTXT  Device text record
0004            DL_RDPDB  Reading PDB record
0005            DL_SETPDB Setting PDB record

001C            Size = 28
0080            DL_LINAC  Linac private record
0108            Analog control field, 8 bytes
13A1            (12-bit D/A via SRM 'A1', mpx D/A #0)
0200
0000
0210            Associated status/ctrl field, 16 bytes
0118            Status Bit#, no inversion
0194            Control Bit#
0408            Pulse hi for 8 cycles
2020            state0-text: '    '
2020
5253            state1-text: 'RST '
5420
```