Midas Reference Manual
1.9.3-3

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- cam_lam_wait * DWORD
  *
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- cam_interrupt_disable

- cam_interrupt_test
- cam_interrupt_attach
   *
- cam_interrupt_detach

6.2.1   Function Documentation

6.2.1.1   EXTERNAL INLINE void EXPRT cam16i (const int c, const int n, const int a, const int f, WORD $* d$)

Parameters:
   c
   n
   a
   f
   d

Returns:

6.2.1.2   EXTERNAL INLINE void EXPRT cam16i_q (const int c, const int n, const int a, const int f, WORD $* d$, int $* x$, int $* q$)

Parameters:
   c
   n
   a
   f
   d
   x
   q

Returns:

6.2.1.3 EXTERNAL INLINE void EXPRT cam16i_r (const int c, const int n, const int a, const int f, WORD $**$ d, const int r)

Parameters:

  c

  n

  a

  f

  d

  r

Returns:

6.2.1.4 EXTERNAL INLINE void EXPRT cam16i_rq (const int c, const int n, const int a, const int f, WORD $**$ d, const int r)

Parameters:

  c

  n

  a

  f

  d

  r

Returns:

6.2.1.5 EXTERNAL INLINE void EXPRT cam16i_sa (const int c, const int n, const int a, const int f, WORD $**$ d, const int r)

```
WORD pbkdat[4];
cam16i_sa(crate, 5, 0, 2, &pbkdat, 4);
```

```
cam16i(crate, 5, 0, 2, &pbkdat[0]);
cam16i(crate, 5, 1, 2, &pbkdat[1]);
cam16i(crate, 5, 2, 2, &pbkdat[2]);
cam16i(crate, 5, 3, 2, &pbkdat[3]);
```

Parameters:

  c

  n

  a

  f

  d

  r

Returns:

6.2.1.6   EXTERNAL INLINE void EXPRT cam16i_sn (const int c, const int n, const int a, const int f, WORD $**$ d, const int r)

```
WORD pbkdat[4];
cam16i_sa(crate, 5, 0, 2, &pbkdat, 4);
```

```
cam16i(crate, 5, 0, 2, &pbkdat[0]);
cam16i(crate, 6, 0, 2, &pbkdat[1]);
cam16i(crate, 7, 0, 2, &pbkdat[2]);
cam16i(crate, 8, 0, 2, &pbkdat[3]);
```

Parameters:

  c

  n

  a

  f

  d

  r

Returns:

6.2.1.7 EXTERNAL INLINE void EXPRT cam16o (const int c, const int n, const int a, const int f, WORD d)

Parameters:

c

n

a

f

d

Returns:

6.2.1.8 EXTERNAL INLINE void EXPRT cam16o_q (const int c, const int n, const int a, const int f, WORD d, int $* x$, int $* q$)

Parameters:

c

n

a

f

d

x

q

Returns:

6.2.1.9 EXTERNAL INLINE void EXPRT cam16o_r (const int c, const int n, const int a, const int f, WORD $* d$, const int r)

Parameters:

    c

    n

    a

    f

    d

    r

Returns:

6.2.1.10 EXTERNAL INLINE void EXPRT cam24i (const int c, const int n, const int a, const int f, DWORD $* d$)

Parameters:

    c

    n

    a

    f

    d

Returns:

6.2.1.11 EXTERNAL INLINE void EXPRT cam24i_q (const int c, const int n, const int a, const int f, DWORD $* d$, int $* x$, int $* q$)

Parameters:

    c

    n

    a

    f

    d

x

q

Returns:

6.2.1.12 EXTERNAL INLINE void EXPRT cam24i_r (const int c, const int n, const int a, const int f, DWORD $**$ d, const int r)

Parameters:

c

n

a

f

d

r

Returns:

6.2.1.13 EXTERNAL INLINE void EXPRT cam24i_rq (const int c, const int n, const int a, const int f, DWORD $**$ d, const int r)

Parameters:

c

n

a

f

d

r

Returns:

6.2.1.14 EXTERNAL INLINE void EXPRT cam24i_sa (const int c, const int n, const int a, const int f, DWORD $**$ d, const int r)

```
DWORD pbkdat[8];
cam24i_sa(crate, 5, 0, 2, &pbkdat, 8);
```

```
cam24i(crate, 5, 0, 2, &pbkdat[0]);
cam24i(crate, 6, 0, 2, &pbkdat[1]);
cam24i(crate, 7, 0, 2, &pbkdat[2]);
cam24i(crate, 8, 0, 2, &pbkdat[3]);
```

Parameters:

> c
>
> n
>
> a
>
> f
>
> d
>
> r

Returns:

6.2.1.15 EXTERNAL INLINE void EXPRT cam24i_sn (const int c, const int n, const int a, const int f, DWORD $**$ d, const int r)

```
DWORD pbkdat[4];
cam24i_sa(crate, 5, 0, 2, &pbkdat, 4);
```

```
cam24i(crate, 5, 0, 2, &pbkdat[0]);
cam24i(crate, 6, 0, 2, &pbkdat[1]);
cam24i(crate, 7, 0, 2, &pbkdat[2]);
cam24i(crate, 8, 0, 2, &pbkdat[3]);
```

Parameters:
    c

    n

    a

    f

    d

    r

Returns:

6.2.1.16 EXTERNAL INLINE void EXPRT cam24o (const int *c*, const int *n*, const int *a*, const int *f*, DWORD *d*)

Parameters:
    c

    n

    a

    f

    d

Returns:

6.2.1.17 EXTERNAL INLINE void EXPRT cam24o_q (const int *c*, const int *n*, const int *a*, const int *f*, DWORD *d*, int $* x$, int $* q$)

Parameters:
    c

    n

    a

    f

    d

    x

q

Returns:

6.2.1.18 EXTERNAL INLINE void EXPRT cam24o_r (const int *c*, const int *n*, const int *a*, const int *f*, DWORD $*$ *d*, const int *r*)

Parameters:

c

n

a

f

d

r

Returns:

6.2.1.19 EXTERNAL INLINE void EXPRT cam8i_q (const int *c*, const int *n*, const int *a*, const int *f*, BYTE $*$ *d*, int $*$ *x*, int $*$ *q*)

Parameters:

c

n

a

f

d

x

q

Returns:

6.2.1.20 EXTERNAL INLINE void EXPRT cam8i_rq (const int c, const int n, const int a, const int f, BYTE $**$ d, const int r)

Parameters:

    c

    n

    a

    f

    d

    r

Returns:

6.2.1.21 EXTERNAL INLINE void EXPRT cam8i_sa (const int c, const int n, const int a, const int f, BYTE $**$ d, const int r)

```
BYTE pbkdat[4];
cam8i_sa(crate, 5, 0, 2, &pbkdat, 4);
```

```
cam8i(crate, 5, 0, 2, &pbkdat[0]);
cam8i(crate, 5, 1, 2, &pbkdat[1]);
cam8i(crate, 5, 2, 2, &pbkdat[2]);
cam8i(crate, 5, 3, 2, &pbkdat[3]);
```

Parameters:

    c

    n

    a

    f

    d

    r

Returns:

**6.2.1.22   EXTERNAL INLINE void EXPRT cam8i_sn (const int *c*,
const int *n*, const int *a*, const int *f*, BYTE ∗∗ *d*, const int *r*)**

```
BYTE pbkdat[4];
cam8i_sa(crate, 5, 0, 2, &pbkdat, 4);
```

```
cam8i(crate, 5, 0, 2, &pbkdat[0]);
cam8i(crate, 6, 0, 2, &pbkdat[1]);
cam8i(crate, 7, 0, 2, &pbkdat[2]);
cam8i(crate, 8, 0, 2, &pbkdat[3]);
```

Parameters:

> *c*
>
> *n*
>
> *a*
>
> *f*
>
> *d*
>
> *r*

Returns:

**6.2.1.23   EXTERNAL INLINE void EXPRT cam8o (const int *c*,
const int *n*, const int *a*, const int *f*, BYTE *d*)**

Parameters:

> *c*
>
> *n*
>
> *a*
>
> *f*
>
> *d*

Returns:

6.2.1.24 EXTERNAL INLINE void EXPRT cam8o_q (const int c, const int n, const int a, const int f, BYTE $\overline{d}$, int $*$ x, int $*$ q)

Parameters:

    c

    n

    a

    f

    d

    x

    q

Returns:

6.2.1.25 EXTERNAL INLINE void EXPRT cam8o_r (const int c, const int n, const int a, const int f, BYTE $*$ d, const int r)

Parameters:

    c

    n

    a

    f

    d

    r

Returns:

6.2.1.26 EXTERNAL INLINE void EXPRT cam_crate_clear (const int c)

Parameters:
> c

Returns:

6.2.1.27   EXTERNAL INLINE void EXPRT cam_crate_zinit (const int c)

Parameters:
> c

Returns:

6.2.1.28   EXTERNAL INLINE void EXPRT cam_exit (void)

6.2.1.29   EXTERNAL INLINE void EXPRT cam_inhibit_clear (const int c)

Parameters:
> c

Returns:

6.2.1.30   EXTERNAL INLINE void EXPRT cam_inhibit_set (const int c)

Parameters:

 c

Returns:

6.2.1.31 EXTERNAL INLINE int EXPRT cam_inhibit_test (const int *c*)

Parameters:

 c

Returns:

6.2.1.32 EXTERNAL INLINE int EXPRT cam_init (void)

Returns:

6.2.1.33 EXTERNAL INLINE int EXPRT cam_init_rpc (char * *host_name*, char * *exp_name*, char * *fe_name*, char * *client_name*, char * *rpc_server*)

For **Parameters** only.

 host_name

 exp_name

 fe_name

 client_name

 rpc_server

Returns:

6.2.1.34   EXTERNAL INLINE void EXPRT cam_interrupt_attach (const int c, const int n, void($*$ isr)(void))

Parameters:

   c

   n

   ($*isr$)

Returns:

6.2.1.35   EXTERNAL INLINE void EXPRT cam_interrupt_detach (const int c, const int n)

Parameters:

   c

   n

Returns:

6.2.1.36   EXTERNAL INLINE void EXPRT cam_interrupt_disable (const int c)

Parameters:

   c

Returns:

6.2.1.37   EXTERNAL INLINE void EXPRT cam_interrupt_enable (const int *c*)

Parameters:
    c

Returns:

6.2.1.38   EXTERNAL INLINE int EXPRT cam_interrupt_test (const int *c*)

Parameters:
    c

Returns:

6.2.1.39   EXTERNAL INLINE void EXPRT cam_lam_clear (const int *c*, const int *n*)

Parameters:
    c

    n

Returns:

6.2.1.40 EXTERNAL INLINE void EXPRT cam_lam_disable (const int c, const int n)

Parameters:

    c

    n

Returns:

6.2.1.41 EXTERNAL INLINE void EXPRT cam_lam_enable (const int c, const int n)

Parameters:

    c

    n

Returns:

6.2.1.42 EXTERNAL INLINE void EXPRT cam_lam_read (const int c, DWORD $*$ lam)

Parameters:

    c

    lam

Returns:

6.2.1.43 EXTERNAL INLINE int EXPRT cam_lam_wait (int $*$ c, DWORD $*$ n, const int *millisec*)

Parameters:
  c

  n

  millisec

Returns:

6.2.1.44 EXTERNAL INLINE void EXPRT camc (const int c, const int n, const int a, const int f)

Parameters:
  c

  n

  a

  f

Returns:

6.2.1.45 EXTERNAL INLINE int EXPRT camc_chk (const int c)

Parameters:
  c

Returns:

6.2.1.46   EXTERNAL INLINE void EXPRT camc_q (const int c, const int n, const int a, const int f, int $* q$)

Parameters:
   c
   n
   a
   f
   q

Returns:

6.2.1.47   EXTERNAL INLINE void EXPRT camc_sa (const int c, const int n, const int a, const int f, const int r)

Parameters:
   c
   n
   a
   f
   r

Returns:

6.2.1.48   EXTERNAL INLINE void EXPRT camc_sn (const int c, const int n, const int a, const int f, const int r)

Parameters:
   c
   n
   a

f

r

Returns:

6.2.1.49 EXTERNAL INLINE void EXPRT cami (const int c, const int n, const int a, const int f, WORD $* d$)

cam16i()   ??

6.2.1.50 EXTERNAL INLINE void EXPRT camo (const int c, const int n, const int a, const int f, WORD d)

cam16o()   ??

6.3 The midas.h & midas.c

Modules

- Midas #define
- Midas Macros
- Midas Error definition
- Midas Structure Declaration
- Midas Message Functions (msg_xxx)
- Midas Common Functions (cm_xxx)
- Midas Buffer Manager Functions (bm_xxx)
- Midas RPC Functions (rpc_xxx)
- Midas Bank Functions (bk_xxx)
- Midas History Functions (hs_xxx)
- Midas Elog Functions (el_xxx)
- Midas Alarm Functions (al_xxx)
- Midas Dual Buffer Memory Functions (dm_xxx)

Defines

- TAPE_BUFFER_SIZE
- NET_TCP_SIZE
- OPT_TCP_SIZE
- NET_UDP_SIZE
- EVENT_BUFFER_SIZE
- EVENT_BUFFER_NAME
- MAX_EVENT_SIZE
- DEFAULT_EVENT_BUFFER_SIZE
- DEFAULT_ODB_SIZE
- NAME_LENGTH
- HOST_NAME_LENGTH
- MAX_CLIENTS
- MAX_EVENT_REQUESTS
- MAX_OPEN_RECORDS
- MAX_ODB_PATH
- MAX_EXPERIMENT
- BANKLIST_MAX
- STRING_BANKLIST_MAX   *
- CH_BS
- LAM_SOURCE   << |
- LAM_STATION   <<
- LAM_SOURCE_CRATE   >>

- LAM_SOURCE_STATION
- CNAF
- ANA_CONTINUE

Variables

- _hKeyClient

6.3.1 Define Documentation

6.3.1.1 #define ANA_CONTINUE 1

****

6.3.1.2 #define ANA_SKIP 0

6.3.1.3 #define BANKLIST_MAX 32

6.3.1.4 #define CH_BS 8

6.3.1.5 #define CH_CR 13

6.3.1.6 #define CH_DELETE (CH_EXT+2)

6.3.1.7 #define CH_DOWN (CH_EXT+7)

6.3.1.8 #define CH_END (CH_EXT+3)

6.3.1.9 #define CH_EXT 0x100

6.3.1.10 #define CH_HOME (CH_EXT+0)

6.3.1.11 #define CH_INSERT (CH_EXT+1)

6.3.1.12 #define CH_LEFT (CH_EXT+9)

6.3.1.13 #define CH_PDOWN (CH_EXT+5)

6.3.1.14 #define CH_PUP (CH_EXT+4)

6.3.1.15 #define CH_RIGHT (CH_EXT+8)

6.3.1.16 #define CH_TAB 9

6.3.1.17 #define CH_UP (CH_EXT+6)

6.3.1.18 #define CNAF 0x1

6.3.1.19 #define CNAF_CRATE_CLEAR 0x102

6.3.1.20 #define CNAF_CRATE_ZINIT 0x103

6.3.1.21 #define CNAF_INHIBIT_CLEAR 0x101

6.3.1.22 #define CNAF_INHIBIT_SET 0x100

6.3.1.23 #define CNAF_nQ 0x2

6.3.1.24 #define CNAF_TEST 0x110

6.3.1.25 #define DEFAULT_EVENT_BUFFER_SIZE 0x200000;

6.3.1.26 #define DEFAULT_ODB_SIZE 0x100000

6.3.1.27 #define DEFAULT_RPC_TIMEOUT 10000

6.3.1.28 #define DEFAULT_WATCHDOG_TIMEOUT 10000

6.3.1.29 #define EVENT_BUFFER_NAME "SYSTEM"

6.3.1.30 #define EVENT_BUFFER_SIZE 0x100000

6.3.1.31 #define HOST_NAME_LENGTH 256

6.3.1.32 #define LAM_SOURCE(c, s) (c<<24 | ((s) & 0xFFFFFF))

Parameters:

    c

    s

6.3.1.33 #define LAM_SOURCE_CRATE(c) (c>>24)

Parameters:

    c

6.3.1.34 #define LAM_SOURCE_STATION(s) ((s) & 0xFFFFFF)

Parameters:

    s

6.3.1.35 #define LAM_STATION(s) (1<<(s-1))

Parameters:

    s

6.3.1.36 #define MAX_CLIENTS 32

6.3.1.37 #define MAX_EVENT_REQUESTS 10

6.3.1.38 #define MAX_EVENT_SIZE 0x80000

6.3.1.39 #define MAX_EXPERIMENT 32

6.3.1.40 #define MAX_ODB_PATH 256

6.3.1.41 #define MAX_OPEN_RECORDS 100

6.3.1.42   #define MIDAS_TCP_PORT 1175

6.3.1.43   #define MIDAS_VERSION "1.9.3"

6.3.1.44   #define NAME_LENGTH 32

6.3.1.45   #define NET_TCP_SIZE 0xFFFF

6.3.1.46   #define NET_UDP_SIZE 8192

6.3.1.47   #define OPT_TCP_SIZE 8192

6.3.1.48 #define STRING_BANKLIST_MAX BANKLIST_MAX ∗ 4

  bk_list()   ??

6.3.1.49 #define TAPE_BUFFER_SIZE 0x8000

6.3.1.50 #define WATCHDOG_INTERVAL 1000

6.3.2 Variable Documentation

6.3.2.1 INT _call_watchdog = TRUE [static]

6.3.2.2 char _client_name[NAME_LENGTH] [static]

6.3.2.3 HNDLE _hDB = 0 [static]

6.3.2.4 HNDLE _hKeyClient = 0 [static]

  ****

6.3.2.5   INT _mutex_alarm

6.3.2.6   INT _mutex_elog

6.3.2.7   char _path_name[MAX_STRING_LENGTH] [static]

6.3.2.8   INT _watchdog_timeout = DEFAULT_WATCHDOG_- TIMEOUT [static]

6.4   Midas #define

Defines

- **STATE_STOPPED**
- **STATE_PAUSED**
- **STATE_RUNNING**
- **FORMAT_MIDAS**
- **FORMAT_YBOS**
- **FORMAT_ASCII**
- **FORMAT_FIXED**
- **FORMAT_DUMP**
- **FORMAT_HBOOK**
- **FORMAT_ROOT**
- **GET_ALL** <<
- **GET_SOME** <<
- **GET_FARM** <<
- **TID_BYTE**
- **TID_SBYTE**
- **TID_CHAR**
- **TID_WORD**
- **TID_SHORT**
- **TID_DWORD**
- **TID_INT**
- **TID_BOOL**
- **TID_FLOAT**
- **TID_DOUBLE**
- **TID_BITFIELD**
- **TID_STRING**
- **TID_ARRAY**
- **TID_STRUCT**
- **TID_KEY**
- **TID_LINK**
- **TID_LAST**
- **SYNC**
- **MODE_READ** <<
- **RPC_OTIMEOUT**
- **WF_WATCH_ME** <<
- **TR_START** <<
- **TR_STOP** <<
- **TR_PAUSE** <<
- **TR_RESUME** <<
- **EQ_PERIODIC** <<

- **EQ_POLLED** <<
- **EQ_INTERRUPT** <<
- **EQ_SLOW** <<
- **EQ_MANUAL_TRIG** <<
- **EQ_FRAGMENTED** <<
- **RO_RUNNING** <<
- **RO_STOPPED** <<
- **RO_PAUSED** <<
- **RO_BOR** <<
- **RO_EOR** <<
- **RO_PAUSE** <<
- **RO_RESUME** <<
- **RO_TRANSITIONS** | |
  |
- **RO_ALWAYS**
- **RO_ODB** <<
- **MT_ERROR** <<
- **MT_INFO** <<
- **MT_DEBUG** <<
- **MT_USER** <<
- **MT_LOG** <<
- **MT_TALK** <<
- **MT_CALL** <<
- **MT_ALL**
- **MERROR**
- **MINFO**
- **MDEBUG**
- **MUSER**
- **MLOG**
- **MTALK**
- **MCALL**

6.4.1 Define Documentation

6.4.1.1 #define ASYNC 1

6.4.1.2   #define EQ_FRAGMENTED (1<<5)

6.4.1.3   #define EQ_INTERRUPT (1<<2)

6.4.1.4   #define EQ_MANUAL_TRIG (1<<4)

6.4.1.5   #define EQ_PERIODIC (1<<0)

6.4.1.6   #define EQ_POLLED (1<<1)

6.4.1.7   #define EQ_SLOW (1<<3)

6.4.1.8   #define EVENTID_ALL -1

6.4.1.9   #define FORMAT_ASCII 3

6.4.1.10   #define FORMAT_DUMP 5

6.4.1.11   #define FORMAT_FIXED 4

6.4.1.12   #define FORMAT_HBOOK 6

6.4.1.13   #define FORMAT_MIDAS 1

6.4.1.14   #define FORMAT_ROOT 7

6.4.1.15 **#define FORMAT_YBOS 2**

6.4.1.16 **#define GET_ALL (1<<0)**

6.4.1.17 **#define GET_FARM (1<<2)**

6.4.1.18 **#define GET_SOME (1<<1)**

6.4.1.19 **#define MCALL MT_CALL, _ _FILE_ _, _ _LINE_ _**

6.4.1.20 **#define MDEBUG MT_DEBUG, _ _FILE_ _, _ _LINE_ _**

-

**6.4.1.21   #define MERROR MT_ERROR, __FILE__,
__LINE__**

-

6.4.1.22   #define MINFO MT_INFO, __FILE__, __LINE__

-

6.4.1.23   #define MLOG MT_LOG, __FILE__, __LINE__

6.4.1.24   #define MODE_ALLOC (1<<7)

6.4.1.25   #define MODE_DELETE (1<<2)

6.4.1.26   #define MODE_EXCLUSIVE (1<<3)

6.4.1.27   #define MODE_READ (1<<0)

6.4.1.28   #define MODE_WRITE (1<<1)

6.4.1.29   #define MT_ALL 0xFF

- •

6.4.1.30 #define MT_CALL (1<<6)

-

6.4.1.31 #define MT_DEBUG (1<<2)

-

6.4.1.32 #define MT_ERROR (1<<0)

-

6.4.1.33 #define MT_INFO (1<<1)

-

6.4.1.34 #define MT_LOG (1<<4)

-

6.4.1.35 #define MT_TALK (1<<5)

-

6.4.1.36 #define MT_USER (1<<3)

-

6.4.1.37 #define MTALK MT_TALK, _ _FILE_ _, _ _LINE_ _

6.4.1.38 #define MUSER MT_USER, _ _FILE_ _, _ _LINE_ _

6.4.1.39 #define RO_ALWAYS (0xFF)

6.4.1.40 #define RO_BOR (1<<3)

6.4.1.41 #define RO_EOR (1<<4)

6.4.1.42 #define RO_ODB (1<<8)

6.4.1.43   #define RO_PAUSE (1<<5)

6.4.1.44   #define RO_PAUSED (1<<2)

6.4.1.45   #define RO_RESUME (1<<6)

6.4.1.46   #define RO_RUNNING (1<<0)

6.4.1.47   #define RO_STOPPED (1<<1)

6.4.1.48   #define RO_TRANSITIONS (RO_BOR|RO_EOR|RO_-PAUSE|RO_RESUME)

6.4.1.49 #define RPC_CLIENT_HANDLE 9

6.4.1.50 #define RPC_CONVERT_FLAGS 7

6.4.1.51 #define RPC_FTCP 1

6.4.1.52 #define RPC_NODELAY 12

6.4.1.53 #define RPC_OCONVERT_FLAG 3

6.4.1.54 #define RPC_ODB_HANDLE 8

6.4.1.55 #define RPC_OHW_TYPE 4

6.4.1.56   #define RPC_OSERVER_NAME 6

6.4.1.57   #define RPC_OSERVER_TYPE 5

6.4.1.58   #define RPC_OTIMEOUT 1

6.4.1.59   #define RPC_OTRANSPORT 2

6.4.1.60   #define RPC_SEND_SOCK 10

6.4.1.61   #define RPC_TCP 0

6.4.1.62   #define RPC_WATCHDOG_TIMEOUT 11

6.4.1.63   #define STATE_PAUSED 2

6.4.1.64   #define STATE_RUNNING 3

6.4.1.65   #define STATE_STOPPED 1

6.4.1.66   #define SYNC 0

6.4.1.67   #define TID_ARRAY 13

6.4.1.68   #define TID_BITFIELD 11

6.4.1.69   #define TID_BOOL 8

6.4.1.70   #define TID_BYTE 1

6.4.1.71   #define TID_CHAR 3

6.4.1.72   #define TID_DOUBLE 10

6.4.1.73   #define TID_DWORD 6

∧

6.4.1.74   #define TID_FLOAT 9

6.4.1.75   #define TID_INT 7

$\wedge$ $\wedge$

6.4.1.76   #define TID_KEY 15

6.4.1.77   #define TID_LAST 17

6.4.1.78   #define TID_LINK 16

6.4.1.79 #define TID_SBYTE 2

6.4.1.80 #define TID_SHORT 5

6.4.1.81 #define TID_STRING 12

6.4.1.82 #define TID_STRUCT 14

6.4.1.83 #define TID_WORD 4

6.4.1.84 #define TR_DEFERRED (1<<12)

6.4.1.85 #define TR_PAUSE (1<<2)

6.4.1.86 #define TR_POSTPAUSE (1<<9)

6.4.1.87 #define TR_POSTRESUME (1<<11)

6.4.1.88 #define TR_POSTSTART (1<<5)

6.4.1.89 #define TR_POSTSTOP (1<<7)

6.4.1.90 #define TR_PREPAUSE (1<<8)

6.4.1.91   #define TR_PRERESUME (1<<10)

6.4.1.92   #define TR_PRESTART (1<<4)

6.4.1.93   #define TR_PRESTOP (1<<6)

6.4.1.94   #define TR_RESUME (1<<3)

6.4.1.95   #define TR_START (1<<0)

6.4.1.96   #define TR_STOP (1<<1)

6.4.1.97 #define TRIGGER_ALL -1

6.4.1.98 #define WF_CALL_WD (1<<1)

6.4.1.99 #define WF_WATCH_ME (1<<0)

6.5 Midas Macros

Defines

- **max** >
- **min** <
- **ALIGN8** ∼
- **VALIGN** ∼

6.5.1 Define Documentation

6.5.1.1 #define ALIGN8(x) (((x)+7) & ∼7)

6.5.1.2 #define max(a, b) (((a) > (b)) ? (a) : (b))

6.5.1.3 #define min(a, b) (((a) < (b)) ? (a) : (b))

6.5.1.4 #define VALIGN(adr, align) (((PTYPE) (adr)+align-1) & ∼(align-1))

6.6 Midas Error definition

Modules

- Status and error codes
- Buffer Manager error codes
- Online Database error codes
- System Services error code
- Remote Procedure Calls error codes
- Other errors

6.7   Midas Structure Declaration

Modules

- **Buffer Section**
- **Equipment related**
- **Bank related**
- **Analyzer related**
- **History related**
- **ODB runinfo related**
- **Alarm related**

6.8 Status and error codes

Defines

- SUCCESS
- CM_SUCCESS
- CM_SET_ERROR
- CM_NO_CLIENT
- CM_DB_ERROR
- CM_UNDEF_EXP
- CM_VERSION_MISMATCH
- CM_SHUTDOWN
- CM_WRONG_PASSWORD
- CM_UNDEF_ENVIRON
- CM_DEFERRED_TRANSITION
- CM_TRANSITION_IN_PROGRESS

6.8.1 Define Documentation

6.8.1.1 #define CM_DB_ERROR 104

6.8.1.2 #define CM_DEFERRED_TRANSITION 110

-

6.8.1.3 #define CM_NO_CLIENT 103

6.8.1.4 #define CM_SET_ERROR 102

6.8.1.5 #define CM_SHUTDOWN 107

-

6.8.1.6 #define CM_SUCCESS 1

6.8.1.7 #define CM_TRANSITION_IN_PROGRESS 111

-

6.8.1.8 #define CM_UNDEF_ENVIRON 109

-

6.8.1.9 #define CM_UNDEF_EXP 105

-

6.8.1.10 #define CM_VERSION_MISMATCH 106

-

6.8.1.11 #define CM_WRONG_PASSWORD 108

-

6.8.1.12 #define SUCCESS 1

6.9 Buffer Manager error codes

Defines

- BM_SUCCESS
- BM_CREATED
- BM_NO_MEMORY
- BM_INVALID_NAME
- BM_INVALID_HANDLE
- BM_NO_SLOT
- BM_NO_MUTEX
- BM_NOT_FOUND
- BM_ASYNC_RETURN
- BM_TRUNCATED
- BM_MULTIPLE_HOSTS
- BM_MEMSIZE_MISMATCH
- BM_CONFLICT
- BM_EXIT
- BM_INVALID_PARAM
- BM_MORE_EVENTS
- BM_INVALID_MIXING
- BM_NO_SHM

6.9.1 Define Documentation

6.9.1.1 #define BM_ASYNC_RETURN 209

-

6.9.1.2 #define BM_CONFLICT 213

-

6.9.1.3 #define BM_CREATED 202

-

6.9.1.4 #define BM_EXIT 214

-

6.9.1.5 #define BM_INVALID_HANDLE 205

-

6.9.1.6 #define BM_INVALID_MIXING 217

-

6.9.1.7 #define BM_INVALID_NAME 204

-

6.9.1.8 #define BM_INVALID_PARAM 215

-

6.9.1.9   #define BM_MEMSIZE_MISMATCH 212

-

6.9.1.10   #define BM_MORE_EVENTS 216

-

6.9.1.11   #define BM_MULTIPLE_HOSTS 211

-

6.9.1.12   #define BM_NO_MEMORY 203

-

6.9.1.13   #define BM_NO_MUTEX 207

-

6.9.1.14   #define BM_NO_SHM 218

-

6.9.1.15   #define BM_NO_SLOT 206

-

6.9.1.16   #define BM_NOT_FOUND 208

-

6.9.1.17   #define BM_SUCCESS 1

-

6.9.1.18   #define BM_TRUNCATED 210

-

6.10 Online Database error codes

Defines

- **DB_SUCCESS**
- **DB_CREATED**
- **DB_NO_MEMORY**
- **DB_INVALID_NAME**
- **DB_INVALID_HANDLE**
- **DB_NO_SLOT**
- **DB_NO_MUTEX**
- **DB_MEMSIZE_MISMATCH**
- **DB_INVALID_PARAM**
- **DB_FULL**
- **DB_KEY_EXIST**
- **DB_NO_KEY**
- **DB_KEY_CREATED**
- **DB_TRUNCATED**
- **DB_TYPE_MISMATCH**
- **DB_NO_MORE_SUBKEYS**
- **DB_FILE_ERROR**
- **DB_NO_ACCESS**
- **DB_STRUCT_SIZE_MISMATCH**
- **DB_OPEN_RECORD**
- **DB_OUT_OF_RANGE**
- **DB_INVALID_LINK**
- **DB_CORRUPTED**
- **DB_STRUCT_MISMATCH**

6.10.1 Define Documentation

6.10.1.1 #define DB_CORRUPTED 323

-

6.10.1.2 #define DB_CREATED 302

-

6.10.1.3 #define DB_FILE_ERROR 317

-

6.10.1.4 #define DB_FULL 310

-

6.10.1.5 #define DB_INVALID_HANDLE 305

-

6.10.1.6 #define DB_INVALID_LINK 322

-

6.10.1.7 #define DB_INVALID_NAME 304

-

6.10.1.8 #define DB_INVALID_PARAM 309

-

6.10.1.9 #define DB_KEY_CREATED 313

-

6.10.1.10 #define DB_KEY_EXIST 311

-

6.10.1.11 #define DB_MEMSIZE_MISMATCH 308

-

6.10.1.12 #define DB_NO_ACCESS 318

-

6.10.1.13 **#define DB_NO_KEY 312**

-

6.10.1.14 **#define DB_NO_MEMORY 303**

-

6.10.1.15 **#define DB_NO_MORE_SUBKEYS 316**

-

6.10.1.16 **#define DB_NO_MUTEX 307**

-

6.10.1.17 #define DB_NO_SLOT 306

-

6.10.1.18 #define DB_OPEN_RECORD 320

-

6.10.1.19 #define DB_OUT_OF_RANGE 321

-

6.10.1.20 #define DB_STRUCT_MISMATCH 324

-

6.10.1.21 #define DB_STRUCT_SIZE_MISMATCH 319

-

6.10.1.22 #define DB_SUCCESS 1

-

6.10.1.23 #define DB_TRUNCATED 314

-

6.10.1.24 #define DB_TYPE_MISMATCH 315

-

6.11   System Services error code

Defines

- **SS_SUCCESS**
- **SS_CREATED**
- **SS_NO_MEMORY**
- **SS_INVALID_NAME**
- **SS_INVALID_HANDLE**
- **SS_INVALID_ADDRESS**
- **SS_FILE_ERROR**
- **SS_NO_MUTEX**
- **SS_NO_PROCESS**
- **SS_NO_THREAD**
- **SS_SOCKET_ERROR**
- **SS_TIMEOUT**
- **SS_SERVER_RECV**
- **SS_CLIENT_RECV**
- **SS_ABORT**
- **SS_EXIT**
- **SS_NO_TAPE**
- **SS_DEV_BUSY**
- **SS_IO_ERROR**
- **SS_TAPE_ERROR**
- **SS_NO_DRIVER**
- **SS_END_OF_TAPE**
- **SS_END_OF_FILE**
- **SS_FILE_EXISTS**
- **SS_NO_SPACE**
- **SS_INVALID_FORMAT**
- **SS_NO_ROOT**

6.11.1   Define Documentation

6.11.1.1   #define SS_ABORT 415

-

6.11.1.2 #define SS_CLIENT_RECV 414

-

6.11.1.3 #define SS_CREATED 402

-

6.11.1.4 #define SS_DEV_BUSY 418

-

6.11.1.5 #define SS_END_OF_FILE 423

-

6.11.1.6 #define SS_END_OF_TAPE 422

-

6.11.1.7 #define SS_EXIT 416

-

6.11.1.8 #define SS_FILE_ERROR 407

-

6.11.1.9 #define SS_FILE_EXISTS 424

-

6.11.1.10 #define SS_INVALID_ADDRESS 406

-

6.11.1.11 #define SS_INVALID_FORMAT 426

-

6.11.1.12 #define SS_INVALID_HANDLE 405

-

6.11.1.13 #define SS_INVALID_NAME 404

-

6.11.1.14 #define SS_IO_ERROR 419

-

6.11.1.15 #define SS_NO_DRIVER 421

-

6.11.1.16 #define SS_NO_MEMORY 403

-

6.11.1.17 #define SS_NO_MUTEX 408

-

6.11.1.18 #define SS_NO_PROCESS 409

-

6.11.1.19 #define SS_NO_ROOT 427

-

6.11.1.20 #define SS_NO_SPACE 425

-

6.11.1.21 #define SS_NO_TAPE 417

-

6.11.1.22 #define SS_NO_THREAD 410

-

6.11.1.23 #define SS_SERVER_RECV 413

-

6.11.1.24 #define SS_SOCKET_ERROR 411

-

6.11.1.25 #define SS_SUCCESS 1

-

6.11.1.26 #define SS_TAPE_ERROR 420

-

6.11.1.27   #define SS_TIMEOUT 412

-

6.12 Remote Procedure Calls error codes

Defines

- **RPC_SUCCESS**
- **RPC_ABORT**
- **RPC_NO_CONNECTION**
- **RPC_NET_ERROR**
- **RPC_TIMEOUT**
- **RPC_EXCEED_BUFFER**
- **RPC_NOT_REGISTERED**
- **RPC_CONNCLOSED**
- **RPC_INVALID_ID**
- **RPC_SHUTDOWN**
- **RPC_NO_MEMORY**
- **RPC_DOUBLE_DEFINED**

6.12.1 Define Documentation

6.12.1.1 #define RPC_ABORT SS_ABORT

-

6.12.1.2 #define RPC_CONNCLOSED 507

-

6.12.1.3 #define RPC_DOUBLE_DEFINED 511

-

6.12.1.4 #define RPC_EXCEED_BUFFER 505

-

6.12.1.5 #define RPC_INVALID_ID 508

-

6.12.1.6 #define RPC_NET_ERROR 503

-

6.12.1.7 #define RPC_NO_CONNECTION 502

-

6.12.1.8 #define RPC_NO_MEMORY 510

-

6.12.1.9 #define RPC_NOT_REGISTERED 506

-

6.12.1.10   #define RPC_SHUTDOWN 509

-

6.12.1.11   #define RPC_SUCCESS 1

-

6.12.1.12   #define RPC_TIMEOUT 504

-

6.13   Other errors

Defines

- FE_SUCCESS
- FE_ERR_ODB
- FE_ERR_HW
- FE_ERR_DISABLED
- FE_ERR_DRIVER
- HS_SUCCESS
- HS_FILE_ERROR
- HS_NO_MEMORY
- HS_TRUNCATED
- HS_WRONG_INDEX
- HS_UNDEFINED_EVENT
- HS_UNDEFINED_VAR
- FTP_SUCCESS
- FTP_NET_ERROR
- FTP_FILE_ERROR
- FTP_RESPONSE_ERROR
- FTP_INVALID_ARG
- EL_SUCCESS
- EL_FILE_ERROR
- EL_NO_MESSAGE
- EL_TRUNCATED
- EL_FIRST_MSG
- EL_LAST_MSG
- AL_SUCCESS
- AL_INVALID_NAME
- AL_ERROR_ODB
- AL_RESET
- CMD_INIT   <<
- CMD_WRITE
- CMD_INTERRUPT_ENABLE
- BD_GETS   →   →

6.13.1 Define Documentation

6.13.1.1 #define AL_ERROR_ODB 1003

-

6.13.1.2 #define AL_INVALID_NAME 1002

-

6.13.1.3 #define AL_RESET 1004

-

6.13.1.4 #define AL_SUCCESS 1

-

6.13.1.5 #define BD_GETS(s, z, p, t) info → bd(CMD_GETS, info → bd_info, s, z, p, t)

6.13.1.6 #define BD_PUTS(s) info → bd(CMD_PUTS, info → bd_info, s)

6.13.1.7 #define BD_READS(s, z, p, t) info → bd(CMD_READ, info → bd_info, s, z, p, t)

6.13.1.8 #define BD_WRITES(s) info → bd(CMD_WRITE, info → bd_info, s)

6.13.1.9 #define CMD_DEBUG 104

6.13.1.10 #define CMD_DISABLE_COMMAND (1<<16)

6.13.1.11 #define CMD_ENABLE_COMMAND (1<<15)

6.13.1.12 #define CMD_EXIT (1<<1)

6.13.1.13 #define CMD_GET (1<<5)

6.13.1.14 #define CMD_GET_ALL (1<<6)

6.13.1.15 #define CMD_GET_CURRENT (1<<7)

6.13.1.16   #define CMD_GET_CURRENT_ALL (1<<8)

6.13.1.17   #define CMD_GET_DEFAULT_NAME (1<<12)

6.13.1.18   #define CMD_GET_DEFAULT_THRESHOLD (1<<13)

6.13.1.19   #define CMD_GET_DEMAND (1<<11)

6.13.1.20   #define CMD_GETS 103

6.13.1.21   #define CMD_IDLE (1<<2)

6.13.1.22   #define CMD_INIT (1<<0)

6.13.1.23   #define CMD_INTERRUPT_ATTACH 102

6.13.1.24 #define CMD_INTERRUPT_DETACH 103

6.13.1.25 #define CMD_INTERRUPT_DISABLE 101

6.13.1.26 #define CMD_INTERRUPT_ENABLE 100

6.13.1.27 #define CMD_NAME 105

6.13.1.28 #define CMD_PUTS 102

6.13.1.29 #define CMD_READ 101

6.13.1.30 #define CMD_SET (1<<3)

6.13.1.31 #define CMD_SET_ALL (1<<4)

6.13.1.32 #define CMD_SET_CURRENT_LIMIT (1<<9)

6.13.1.33   #define CMD_SET_CURRENT_LIMIT_ALL (1<<10)

6.13.1.34   #define CMD_SET_LABEL (1<<14)

6.13.1.35   #define CMD_WRITE 100

6.13.1.36   #define EL_FILE_ERROR 902

-

6.13.1.37   #define EL_FIRST_MSG 905

-

6.13.1.38   #define EL_LAST_MSG 906

-

6.13.1.39   #define EL_NO_MESSAGE 903

-

6.13.1.40 **#define EL_SUCCESS 1**

-

6.13.1.41 **#define EL_TRUNCATED 904**

-

6.13.1.42 **#define FE_ERR_DISABLED 604**

-

6.13.1.43 **#define FE_ERR_DRIVER 605**

-

6.13.1.44 **#define FE_ERR_HW 603**

-

6.13.1.45 **#define FE_ERR_ODB 602**

-

6.13.1.46   #define FE_SUCCESS 1

-

6.13.1.47   #define FTP_FILE_ERROR 803

-

6.13.1.48   #define FTP_INVALID_ARG 805

-

6.13.1.49   #define FTP_NET_ERROR 802

-

6.13.1.50   #define FTP_RESPONSE_ERROR 804

-

6.13.1.51   #define FTP_SUCCESS 1

-

6.13.1.52 **#define HS_FILE_ERROR 702**

-

6.13.1.53 **#define HS_NO_MEMORY 703**

-

6.13.1.54 **#define HS_SUCCESS 1**

-

6.13.1.55 **#define HS_TRUNCATED 704**

-

6.13.1.56 **#define HS_UNDEFINED_EVENT 706**

-

6.13.1.57 **#define HS_UNDEFINED_VAR 707**

-

6.13.1.58 **#define HS_WRONG_INDEX 705**

-

6.14   Buffer Section

Data Structures

- **BUFFER**
- **BUFFER_CLIENT**
- **BUFFER_HEADER**
- **EVENT_HEADER**
- **EVENT_REQUEST**
- **KEY**
- **KEYLIST**

Defines

- **TRIGGER_MASK**   **EVENT_HEADER** $*$ $\rightarrow$

- **EVENT_ID**   **EVENT_HEADER** $*$ $\rightarrow$

- **SERIAL_NUMBER**   **EVENT_HEADER** $*$ $\rightarrow$

- **TIME_STAMP**   **EVENT_HEADER** $*$ $\rightarrow$

- **EVENTID_BOR**
- **EVENTID_EOR**
- **EVENTID_MESSAGE**
- **EVENTID_FRAG1**
- **MIDAS_MAGIC**

6.14.1   Define Documentation

6.14.1.1   #define EVENT_ID(e) ((((EVENT_HEADER $*$) e)-1) $\rightarrow$ event_id)

Parameters:
    e

6.14.1.2   #define EVENT_SOURCE(e, o) ($*$ (INT$*$) (e+o))

6.14.1.3 #define EVENTID_BOR ((short int) 0x8000)

6.14.1.4 #define EVENTID_EOR ((short int) 0x8001)

6.14.1.5 #define EVENTID_FRAG ((unsigned short) 0xD000)

6.14.1.6 #define EVENTID_FRAG1 ((unsigned short) 0xC000)

6.14.1.7 #define EVENTID_MESSAGE ((short int) 0x8002)

6.14.1.8 #define MIDAS_MAGIC 0x494d

6.14.1.9 #define SERIAL_NUMBER(e) ((((EVENT_HEADER ∗) e)-1) → serial_number)

Parameters:

    e

6.14.1.10 #define TIME_STAMP(e) ((((EVENT_HEADER ∗) e)-1) → time_stamp)

Parameters:

    e

6.14.1.11 #define TRIGGER_MASK(e) ((((EVENT_HEADER ∗) e)-1) → trigger_mask)

Parameters:

    e

6.15   Equipment related

Data Structures

- **BUS_DRIVER**
- **DEVICE_DRIVER**
- **eqpmnt**
- **EQUIPMENT_INFO**
- **EQUIPMENT_STATS**

Defines

- **DF_INPUT**   <<
- **DF_OUTPUT**   <<
- **DF_PRIO_DEVICE**   <<
- **DF_READ_ONLY**   <<

6.15.1   Define Documentation

6.15.1.1   #define DF_INPUT (1<<0)

6.15.1.2   #define DF_OUTPUT (1<<1)

6.15.1.3   #define DF_PRIO_DEVICE (1<<2)

6.15.1.4   #define DF_READ_ONLY (1<<3)

6.15.2 Typedef Documentation

6.15.2.1 typedef struct eqpmnt EQUIPMENT

6.15.2.2 typedef struct eqpmnt* PEQUIPMENT

6.16   Bank related

Data Structures

- **BANK**
- **BANK32**
- **BANK_HEADER**
- **BANK_LIST**
- **TAG**

Defines

- **BANK_FORMAT_VERSION**
- **BANK_FORMAT_32BIT**   <<

6.16.1   Define Documentation

6.16.1.1   #define BANK_FORMAT_32BIT (1<<4)

-

6.16.1.2   #define BANK_FORMAT_VERSION 1

-

6.17 Analyzer related

Data Structures

- **ANA_MODULE**
- **ANA_TEST**
- **ANALYZE_REQUEST**
- **AR_INFO**
- **AR_STATS**

6.17.1 Define Documentation

6.17.1.1 #define DEF_TEST(t) extern ANA_TEST t;

6.17.1.2 #define SET_TEST(t, v) { if (!t.registered) test_register(&t); t.value = (v); }

6.17.1.3 #define TEST(t) (t.value)

6.18   History related

Data Structures

- **DEF_RECORD**
- **HIST_RECORD**
- **HISTORY**
- **INDEX_RECORD**

6.18.1   Define Documentation

6.18.1.1   #define RT_DATA ($*$((DWORD $*$) "HSDA"))

6.18.1.2   #define RT_DEF ($*$((DWORD $*$) "HSDF"))

6.19 ODB runinfo related

Data Structures

- **RUNINFO**

6.19.1 Define Documentation

6.19.1.1 #define RUNINFO_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"State = INT : 1",\
"Online Mode = INT : 1",\
"Run number = INT : 0",\
"Transition in progress = INT : 0",\
"Requested transition = INT : 0",\
"Start time = STRING : [32] Tue Sep 09 15:04:42 1997",\
"Start time binary = DWORD : 0",\
"Stop time = STRING : [32] Tue Sep 09 15:04:42 1997",\
"Stop time binary = DWORD : 0",\
"",\
NULL }
```

6.20   Alarm related

6.20.1   Detailed Description

Data Structures

- **ALARM**
- **ALARM_CLASS**
- **PROGRAM_INFO**

Defines

- **AT_INTERNAL**
- **AT_PROGRAM**
- **AT_EVALUATED**
- **AT_PERIODIC**
- **AT_LAST**

6.20.2   Define Documentation

6.20.2.1   #define ALARM_CLASS_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Write system message = BOOL : y",\
"Write Elog message = BOOL : n",\
"System message interval = INT : 60",\
"System message last = DWORD : 0",\
"Execute command = STRING : [256] ",\
"Execute interval = INT : 0",\
"Execute last = DWORD : 0",\
"Stop run = BOOL : n",\
"Display BGColor = STRING : [32] red",\
"Display FGColor = STRING : [32] black",\
"",\
NULL }
```

6.20.2.2 #define ALARM_ODB_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Active = BOOL : n",\
"Triggered = INT : 0",\
"Type = INT : 3",\
"Check interval = INT : 60",\
"Checked last = DWORD : 0",\
"Time triggered first = STRING : [32] ",\
"Time triggered last = STRING : [32] ",\
"Condition = STRING : [256] /Runinfo/Run number > 100",\
"Alarm Class = STRING : [32] Alarm",\
"Alarm Message = STRING : [80] Run number became too large",\
"",\
NULL }
```

6.20.2.3 #define ALARM_PERIODIC_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Active = BOOL : n",\
"Triggered = INT : 0",\
"Type = INT : 4",\
"Check interval = INT : 28800",\
"Checked last = DWORD : 0",\
"Time triggered first = STRING : [32] ",\
"Time triggered last = STRING : [32] ",\
"Condition = STRING : [256] ",\
"Alarm Class = STRING : [32] Warning",\
"Alarm Message = STRING : [80] Please do your shift checks",\
"",\
NULL }
```

6.20.2.4 #define AT_EVALUATED 3

-

6.20.2.5 #define AT_INTERNAL 1

-

6.20.2.6 #define AT_LAST 4

-

6.20.2.7 #define AT_PERIODIC 4

-

6.20.2.8 #define AT_PROGRAM 2

-

6.20.2.9 #define PROGRAM_INFO_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Required = BOOL : n",\
"Watchdog timeout = INT : 10000",\
"Check interval = DWORD : 180000",\
"Start command = STRING : [256] ",\
"Auto start = BOOL : n",\
"Auto stop = BOOL : n",\
"Auto restart = BOOL : n",\
"Alarm class = STRING : [32] ",\
"First failed = DWORD : 0",\
"",\
NULL }
```

6.21   The ybos.h & ybos.c

Modules

- **YBOS #define**
- **YBOS error code**
- **YBOS Macros**
- **YBOS Bank Functions (ybk_xxx)**

6.22 YBOS #define

Defines

- **YBOS_PHYREC_SIZE**
- **YBOS_BUFFER_SIZE** $*$ $<<$

- **YB_BANKLIST_MAX**
- **YB_STRING_BANKLIST_MAX**
  $*$
- **H_BLOCK_SIZE**
- **H_BLOCK_NUM**
- **H_HEAD_LEN**
- **H_START**
- **D_RECORD**
- **D_HEADER**
- **D_EVTLEN**
- **YB_COMPLETE**
- **YB_INCOMPLETE**
- **YB_NO_RECOVER**
- **YB_NO_RUN**
- **YB_ADD_RUN**
- **DSP_RAW**
- **DSP_BANK**
- **DSP_UNK**
- **DSP_DEC**
- **DSP_HEX**
- **DSP_ASC**
- **I2_BKTYPE**
- **A1_BKTYPE**
- **I4_BKTYPE**
- **F4_BKTYPE**
- **D8_BKTYPE**
- **I1_BKTYPE**
- **MAX_BKTYPE**

6.22.1 Define Documentation

6.22.1.1 #define A1_BKTYPE 2

6.22.1.2   #define D8_BKTYPE 5

6.22.1.3   #define D_EVTLEN 3

6.22.1.4   #define D_HEADER 2

6.22.1.5   #define D_RECORD 1

6.22.1.6   #define DSP_ASC 3

6.22.1.7   #define DSP_BANK 2

6.22.1.8   #define DSP_DEC 1

6.22.1.9 #define DSP_HEX 2

6.22.1.10 #define DSP_RAW 1

6.22.1.11 #define DSP_UNK 0

6.22.1.12 #define F4_BKTYPE 4

6.22.1.13 #define H_BLOCK_NUM 1

6.22.1.14 #define H_BLOCK_SIZE 0

6.22.1.15 #define H_HEAD_LEN 2

6.22.1.16 #define H_START 3

6.22.1.17 #define I1_BKTYPE 8

6.22.1.18 #define I2_BKTYPE 1

6.22.1.19 #define I4_BKTYPE 3

6.22.1.20 #define MAX_BKTYPE I1_BKTYPE+1

6.22.1.21 #define YB_ADD_RUN 1

6.22.1.22 #define YB_BANKLIST_MAX 32

ybk_list() ?? bk_-
list() ??

6.22.1.23 #define YB_COMPLETE 1

6.22.1.24 #define YB_INCOMPLETE 2

6.22.1.25 #define YB_NO_RECOVER -1

6.22.1.26 #define YB_NO_RUN 0

6.22.1.27 #define YB_STRING_BANKLIST_MAX YB_BANKLIST_MAX ∗ 4

6.22.1.28 #define YBOS_BUFFER_SIZE 3∗(YBOS_-PHYREC_SIZE<<2) + MAX_EVENT_SIZE + 128

6.22.1.29 #define YBOS_HEADER_LENGTH 4

6.22.1.30   #define YBOS_PHYREC_SIZE 8192

∗

6.23 YBOS Macros

Defines

- **SWAP_D2WORD**
- **EVID_TRINAT**
- **YBOS_EVID_BANK**
- **MIDAS_EVID_BANK**

6.23.1 Define Documentation

6.23.1.1 #define EVID_TRINAT

Midas build options and operation considerations   ??

```
// check if EVID is present if so display its content
if ((status = ybk_find (pybos, "EVID", &bklen, &bktyp, (void *)&pybk)) == YB_SUCCESS)
{
  pdata = (DWORD *)((YBOS_BANK_HEADER *)pybk + 1);
  pevent->event_id      = YBOS_EVID_EVENT_ID(pdata);
  pevent->trigger_mask  = YBOS_EVID_TRIGGER_MASK(pdata);
  pevent->serial_number = YBOS_EVID_SERIAL(pdata);
  pevent->time_stamp    = YBOS_EVID_TIME(pdata);
  pevent->data_size     = pybk->length;
}
```

```
      ybk_create((DWORD *)pevent, "EVID", I4_BKTYPE, (DWORD *)(&pbkdat));
      *((WORD *)pbkdat) = EVENT_ID(pevent);    ((WORD *)pbkdat)++;
```

```
      *((WORD *)pbkdat) = TRIGGER_MASK(pevent); ((WORD *)pbkdat)++;
      *(pbkdat)++ = SERIAL_NUMBER(pevent);
      *(pbkdat)++ = TIME_STAMP(pevent);
      *(pbkdat)++ = gbl_run_number;                    // run number



      ybk_create((DWORD *)pevent, "EVID", I4_BKTYPE, &pbkdat);
      *((WORD *)pbkdat) = EVENT_ID(pevent);      ((WORD *)pbkdat)++;
      *((WORD *)pbkdat) = TRIGGER_MASK(pevent); ((WORD *)pbkdat)++;
      *(pbkdat)++ = SERIAL_NUMBER(pevent);
      *(pbkdat)++ = TIME_STAMP(pevent);
      *(pbkdat)++ = gbl_run_number;                    // run number
      *(pbkdat)++ = *((DWORD *)frontend_name);         // frontend name
      ybk_close((DWORD *)pevent, pbkdat);
```

6.23.1.2 #define MIDAS_EVID_BANK(_ _a, _ _b, _ _c, _ _d, _ _e)

Value:

```
{\
      DWORD * pbuf;\
      bk_create(__a, "EVID", TID_DWORD, &pbuf);\
      *(pbuf)++ = (DWORD)__b;\
      *(pbuf)++ = (DWORD)__c;\
      *(pbuf)++ = (DWORD)__d;\
      *(pbuf)++ = (DWORD)ss_millitime();\
      *(pbuf)++ = (DWORD)__e;\
      bk_close(__a, pbuf);\
        }
```

6.23.1.3 #define SWAP_D2WORD(_d2w)

Value:

```
{\
  WORD _tmp2;                                    \
  _tmp2                  = *((WORD *)(_d2w));     \
  *((WORD *)(_d2w))      = *(((WORD *)(_d2w))+1); \
  *(((WORD *)(_d2w))+1) = _tmp2;                  \
}
```

```
                    >
```

6.23.1.4 #define YBOS_EVID_BANK(__a, __b, __c, __d, __e)

Value:

```
{\
    DWORD * pbuf;\
    ybk_create(__a, "EVID", I4_BKTYPE, &pbuf);\
    *(pbuf)++ = (DWORD)__b;\
    *(pbuf)++ = (DWORD)__c;\
    *(pbuf)++ = (DWORD)__d;\
    *(pbuf)++ = (DWORD)ss_millitime();\
    *(pbuf)++ = (DWORD)__e;\
    ybk_close(__a, pbuf);\
      }
```

6.23.1.5 #define YBOS_EVID_EVENT_ID(e) *((WORD *)(e)+1)

6.23.1.6 #define YBOS_EVID_EVENT_NB(e) *((DWORD *)(e)+1)

6.23.1.7 #define YBOS_EVID_RUN_NUMBER(e) *((DWORD *)(e)+3)

6.23.1.8 #define YBOS_EVID_SERIAL(e) *((DWORD *)(e)+1)

6.23.1.9 #define YBOS_EVID_TIME(e) *((DWORD *)(e)+2)

6.23.1.10 #define YBOS_EVID_TRIGGER_MASK(e)
$*((\textbf{WORD} *)(\textbf{e})+0)$

6.24 YBOS error code

Defines

- YB_SUCCESS
- YB_EVENT_NOT_SWAPPED
- YB_DONE
- YB_WRONG_BANK_TYPE
- YB_BANK_NOT_FOUND
- YB_SWAP_ERROR
- YB_NOMORE_SLOT
- YB_UNKNOWN_FORMAT

6.24.1 Define Documentation

6.24.1.1 #define YB_BANK_NOT_FOUND -101

6.24.1.2 #define YB_DONE 2

6.24.1.3 #define YB_EVENT_NOT_SWAPPED 2

6.24.1.4 #define YB_NOMORE_SLOT -103

6.24.1.5 #define YB_SUCCESS 1

6.24.1.6 #define YB_SWAP_ERROR -102

6.24.1.7 #define YB_UNKNOWN_FORMAT -104

YBOS format ??

6.24.1.8 #define YB_WRONG_BANK_TYPE -100

YBOS Bank Types ??

6.25   YBOS Bank Functions (ybk_xxx)

Functions

- **ybk_init DWORD** $*$
- **ybk_create DWORD** $*$ $*$ **DWORD**
  $*$
- **ybk_close DWORD** $*$ $*$
- **ybk_size DWORD** $*$
- **ybk_list DWORD** $*$ $*$
- **ybk_find DWORD** $*$ $*$ **DWORD** $*$
  DWORD $*$ $**$
- **ybk_locate DWORD** $*$ $*$ $*$
- **ybk_iterate DWORD** $*$ $**$
  $**$

6.25.1   Function Documentation

6.25.1.1   INT ybk_close (DWORD $*$ *plrl*, void $*$ *pbkdat*)

ybk_create()   ??

ybk_create()   ??

ybk_close()   ??

YBOS bank examples   ??

Parameters:
    plrl

    pbkdat

Returns:

6.25.1.2   void ybk_create (DWORD $*$ *plrl*, char $*$ *bkname*, DWORD *bktype*, void $*$ *pbkdat*)

YBOS bank examples   ??

---

ybk_init() ??

YBOS bank examples ??

Parameters:
  plrl

  bkname

  bktype YBOS Bank Types ??

  pbkdat

Returns:

6.25.1.3 INT ybk_find (DWORD ∗ *plrl*, char ∗ *bkname*, DWORD ∗ *bklen*, DWORD ∗ *bktype*, void ∗∗ *pbk*)

Parameters:
  plrl

  bkname

  bklen

  bktype

  pbk

Returns:

6.25.1.4 void ybk_init (DWORD ∗ *plrl*)

ybk_init() ??

YBOS bank examples ??

Parameters:
    plrl

Returns:

6.25.1.5 INT ybk_iterate (DWORD ∗ *plrl*, YBOS_BANK_HEADER ∗∗ *pybkh*, void ∗∗ *pdata*)

Parameters:
    plrl

    pybkh

    pdata

Returns:

6.25.1.6 INT ybk_list (DWORD ∗ *plrl*, char ∗ *bklist*)

    bk_list()   ??

Parameters:
    plrl

    bklist

Returns:

6.25.1.7   INT ybk_locate (DWORD ∗ *plrl*, char ∗ *bkname*, void ∗ *pdata*)

Parameters:
  plrl

  bkname

  pdata

Returns:

<center>$<$</center>

6.25.1.8   INT ybk_size (DWORD ∗ *plrl*)

Parameters:
  plrl

Returns:

6.26 Midas Common Functions (cm_xxx)

Functions

- cm_synchronize DWORD *
- cm_asctime   *
- cm_time DWORD *
- * cm_get_version
- cm_set_path   *
- cm_get_path   *
- cm_scan_experiments
- cm_delete_client_info   hDB
- cm_check_client   hDB
- cm_set_client_info   hDB   *
  *host_name   *   *
  DWORD
- cm_get_client_info   *
- cm_get_environment   *host_name
  *exp_name
- cm_connect_experiment   *host_name   *exp_-
  name   *   *   *
- cm_connect_experiment1   *host_name   *exp_-
  name   *   *   *   odb_size
  DWORD
- cm_list_experiments   *host_name   exp_-
  name
- cm_select_experiment   *host_name   *exp_name
- cm_connect_client   *   *
- cm_disconnect_client
- cm_disconnect_experiment
- cm_set_experiment_database   hDB

- cm_get_experiment_database   *hDB   *

- cm_set_watchdog_params   DWORD

- cm_get_watchdog_params   *   DWORD
  *
- cm_get_watchdog_info   hDB   *
  DWORD *   DWORD *
- cm_register_transition   *
  *
- cm_register_deferred_transition
        *

- cm_check_deferred_transition
- cm_transition   run_number   *

- cm_yield
- cm_execute   *   *
- cm_shutdown   *
- cm_exist   *
- cm_cleanup   *

6.26.1   Function Documentation

6.26.1.1   INT cm_asctime (char * *str*, INT *buf_size*)

Parameters:
str

buf_size

Returns:

6.26.1.2   INT cm_check_client (HNDLE *hDB*, HNDLE *hKeyClient*)

Parameters:
hDB

hKeyClient

Returns:

6.26.1.3   INT cm_check_deferred_transition ()

Returns:

$<$ $>$ **cm_transition()**   **??**

6.26.1.4   INT cm_cleanup (char $*$ *client_name*, BOOL *ignore_timeout*)

$<$ $>$

$*$

Parameters:

client_name

ignore_timeout

Returns:

6.26.1.5   INT cm_connect_client (char ∗ *client_name*, HNDLE ∗ *hConn*)

For Pratemetterse only.
Parameters:
        client_name

        hConn
    Returns:

6.26.1.6   INT cm_connect_experiment (char ∗ *host_name*, char ∗ *exp_name*, char ∗ *client_name*, void(∗ *func*)(char ∗))

Attention:

                        Environment variables   ??
                cm_get_environment()   ??
        cm_connect_experiment()   ??
                                            cm_get_-
    environment()   ??   cm_connect_experiment()   ??
        cm_disconnect_experiment()   ??

```
#include <stdio.h>
#include <midas.h>
main(int argc, char *argv[])
{
  INT  status, i;
```

```
      char host_name[256],exp_name[32];

      // get default values from environment
      cm_get_environment(host_name, exp_name);

      // parse command line parameters
      for (i=1 ; i<argc ; i++)
        {
        if (argv[i][0] == '-')
          {
          if (i+1 >= argc || argv[i+1][0] == '-')
            goto usage;
          if (argv[i][1] == 'e')
            strcpy(exp_name, argv[++i]);
          else if (argv[i][1] == 'h')
            strcpy(host_name, argv[++i]);
          else
            {
usage:
            printf("usage: test [-h Hostname] [-e Experiment]\n\n");
            return 1;
            }
          }
        }
      status = cm_connect_experiment(host_name, exp_name, "Test", NULL);
      if (status != CM_SUCCESS)
        return 1;
      ...do operations...
      cm_disconnect_experiment();
    }
```

Parameters:

host_ name

exp_ name

client_ name

func

Returns:

6.26.1.7   INT cm_connect_experiment1 (char ∗ *host_name*, char ∗ *exp_name*, char ∗ *client_name*, void(∗ *func*)(char ∗), INT *odb_size*, DWORD *watchdog_timeout*)

For internal use only.

6.26.1.8   INT cm_delete_client_info (HNDLE *hDB*, INT *pid*)

Parameters:
  hDB
  pid

Returns:

6.26.1.9   INT cm_disconnect_client (HNDLE *hConn*, BOOL *bShutdown*)

Parameters:
  hConn   cm_connect_client()   ??
  bShutdown

Returns:

6.26.1.10   INT cm_disconnect_experiment (void)

Attention:

cm_connect_experiment()   ??

Returns:

6.26.1.11   INT cm_execute (char ∗ *command*, char ∗ *result*, INT *bufsize*)

Parameters:
    command
    result
    bufsize

Returns:

6.26.1.12   INT cm_exist (char ∗ *name*, BOOL *bUnique*)

Parameters:
    name

bUnique

Returns:

6.26.1.13   INT cm_get_client_info (char ∗ *client_name*)

Parameters:
   ∗*client_name*

Returns:

6.26.1.14   INT cm_get_environment (char ∗ *host_name*, int *host_name_size*, char ∗ *exp_name*, int *exp_name_size*)

Attention:

Environment variables ??

```
#include <stdio.h>
#include <midas.h>
main(int argc, char *argv[])
{
  INT  status, i;
  char host_name[256],exp_name[32];

  // get default values from environment
  cm_get_environment(host_name, exp_name);

  // parse command line parameters
```

```
    for (i=1 ; i<argc ; i++)
      {
      if (argv[i][0] == '-')
        {
        if (i+1 >= argc || argv[i+1][0] == '-')
          goto usage;
        if (argv[i][1] == 'e')
          strcpy(exp_name, argv[++i]);
        else if (argv[i][1] == 'h')
          strcpy(host_name, argv[++i]);
        else
          {
usage:
          printf("usage: test [-h Hostname] [-e Experiment]\n\n");
          return 1;
          }
        }
      }
    status = cm_connect_experiment(host_name, exp_name, "Test", NULL);
    if (status != CM_SUCCESS)
      return 1;
      ...do anyting...
    cm_disconnect_experiment();
  }
```

Parameters:

host_name

host_name_size

exp_name

exp_name_size

Returns:

6.26.1.15 INT cm_get_experiment_database (HNDLE ∗ *hDB*, HNDLE ∗ *hKeyClient*)

Attention:

```
HNDLE hDB, hkeyclient;
 char  name[32];
 int   size;
 db_get_experiment_database(&hdb, &hkeyclient);
 size = sizeof(name);
 db_get_value(hdb, hkeyclient, "Name", name, &size, TID_STRING, TRUE);
 printf("My name is %s\n", name);
```

Parameters:
   hDB
   hKeyClient

Returns:

6.26.1.16   INT cm_get_path (char $*$ *path*)

Parameters:
   path

Returns:

6.26.1.17   char$*$ cm_get_version ()

Returns:
                $*$

6.26.1.18   INT cm_get_watchdog_info (HNDLE *hDB*, char ∗ *client_name*, DWORD ∗ *timeout*, DWORD ∗ *last*)

Parameters:
    hDB

    client_name

    timeout

    last

Returns:

6.26.1.19   INT cm_get_watchdog_params (BOOL ∗ *call_watchdog*, DWORD ∗ *timeout*)

Parameters:
    call_watchdog

    timeout

Returns:

6.26.1.20   INT cm_list_experiments (char ∗ *host_name*, char *exp_name*[MAX_EXPERIMENT][NAME_LENGTH])

    ∗

Parameters:
    host_name

    exp_name

Returns:

6.26.1.21 INT cm_register_deferred_transition (INT *transition*, BOOL(* *func*)(INT, BOOL))

Parameters:
  transition

  (∗func)

Returns:

$$< \quad >$$

6.26.1.22 INT cm_register_transition (INT *transition*, INT(* *func*)(INT, char ∗))

$$< \quad >$$

Attention:

cm_-

  yield()   ??

```
INT start(INT run_number, char *error)
{
  if (<not ok>)
    {
    strcpy(error, "Cannot start because ...");
    return 2;
    }
  printf("Starting run %d\n", run_number);
  return CM_SUCCESS;
}
main()
{
  ...
  cm_register_transition(TR_START, start);
  do
    {
    status = cm_yield(1000);
    } while (status != RPC_SHUTDOWN &&
             status != SS_ABORT);
  ...
}
```

Parameters:
  transition

  func

Returns:

6.26.1.23   INT cm_scan_experiments (void)

Returns:

6.26.1.24 INT cm_select_experiment (char ∗ *host_name*, char ∗ *exp_name*)

For Parametersse only.
host_name
exp_name

Returns:

6.26.1.25 INT cm_set_client_info (HNDLE *hDB*, HNDLE ∗ *hKeyClient*, char ∗ *host_name*, char ∗ *client_name*, INT *hw_type*, char ∗ *password*, DWORD *watchdog_timeout*)

Parameters:
hDB
hKeyClient
host_name
client_name
hw_type
password
watchdog_timeout
< >

Returns:

6.26.1.26 INT cm_set_experiment_database (HNDLE *hDB*, HNDLE *hKeyClient*)

Parameters:
> *hDB*
>
> *hKeyClient*

Returns:

6.26.1.27   INT cm_set_path (char ∗ *path*)

Parameters:
> *path*

Returns:

6.26.1.28   INT cm_set_watchdog_params (BOOL *call_watchdog*, DWORD *timeout*)

Parameters:
> *call_watchdog*
> *timeout*

Returns:

6.26.1.29 INT cm_shutdown (char * *name*, BOOL *bUnique*)

Parameters:
> *name*
> *bUnique*

Returns:

6.26.1.30 INT cm_synchronize (DWORD * *seconds*)

Parameters:
> *seconds*

Returns:

6.26.1.31   INT cm_time (DWORD ∗ *time*)

Parameters:
    time

Returns:

6.26.1.32   INT cm_transition (INT *transition*, INT *run_ number*, char ∗ *perror*, INT *strsize*, INT *async_ flag*, INT *debug_ flag*)

cm_transition()   ??

cm_transition()   ??

```
...
   i = 1;
   db_set_value(hDB, 0, "/Runinfo/Transition in progress", &i, sizeof(INT), 1, TID_INT);

     status = cm_transition(TR_START, new_run_number, str, sizeof(str), SYNC, debug_flag);
     if (status != CM_SUCCESS)
     {
       // in case of error
       printf("Error: %s\n", str);
     }
   ...
```

Parameters:

    transition

    run_number

    perror

    strsize

    async_flag

    debug_flag

Returns:

$$< \quad >$$

6.26.1.33 INT cm_yield (INT *millisec*)

Parameters:

    millisec

Returns:

6.27 Midas Buffer Manager Functions (bm_xxx)

Functions

- **bm_match_event**
  EVENT_HEADER ∗
- **bm_open_buffer** ∗
  ∗
- **bm_close_buffer**
- **bm_close_all_buffers**
- **bm_set_cache_size**

- **bm_compose_event** **EVENT_HEADER** ∗
  DWORD **DWORD**

- **bm_request_event**
  ∗
  ∗ **EVENT_HEADER** ∗ ∗
- **bm_remove_event_request**

- **bm_delete_request**
- **bm_send_event** ∗

- **bm_flush_cache**
- **bm_receive_event** ∗
  ∗
- **bm_skip_event**
- **bm_push_event** ∗
- **bm_check_buffers**
- **bm_empty_buffers**

6.27.1 Function Documentation

6.27.1.1 INT bm_check_buffers ()

Returns:

6.27.1.2   INT bm_close_all_buffers (void)

Returns:

6.27.1.3   INT bm_close_buffer (INT *buffer_handle*)

bm_open_buffer()   ??

Parameters:
     buffer_handle

Returns:

6.27.1.4   INT bm_compose_event (EVENT_HEADER ∗ *event_header*, short int *event_id*, short int *trigger_mask*, DWORD *size*, DWORD *serial*)

$>$ $<$ $>$

```
typedef struct {
 short int      event_id;
 short int      trigger_mask;
 DWORD          serial_number;
 DWORD          time_stamp;
 DWORD          data_size;
} EVENT_HEADER;

char event[1000];
 bm_compose_event((EVENT_HEADER *)event, 1, 0, 100, 1);
 *(event+sizeof(EVENT_HEADER)) = <...>
```

Parameters:
     event_header

> *event_id*
> *trigger_mask*
> *size*
> *serial*

Returns:

6.27.1.5   INT bm_delete_request (INT *request_id*)

bm_request_event()   ??

bm_close_buffer()   ??

Parameters:
   request_id   **bm_request_event()   ??**

Returns:

6.27.1.6   INT bm_empty_buffers ()

bm_set_cache_size()   ??

**bm_empty_-
buffers()   ??**

---

mfe.c **??**

Returns:

6.27.1.7 INT bm_flush_cache (INT *buffer_handle*, INT *async_flag*)

Parameters:
  buffer_handle   bm_open_buffer() **??**
  async_flag

Returns:

  midas.h **??**

6.27.1.8 INT bm_match_event (short int *event_id*, short int *trigger_mask*, EVENT_HEADER ∗ *pevent*)

Parameters:
  event_id

  trigger_mask

  pevent

Returns:

6.27.1.9   INT bm_open_buffer (char ∗ *buffer_name*, INT *buffer_size*, INT ∗ *buffer_handle*)

  midas.h   ??

```
#include <stdio.h>
#include "midas.h"
void process_event(HNDLE hbuf, HNDLE request_id,
           EVENT_HEADER *pheader, void *pevent)
{
  printf("Received event #%d\r",
  pheader->serial_number);
}
main()
{
  INT status, request_id;
  HNDLE hbuf;
  status = cm_connect_experiment("pc810", "Sample", "Simple Analyzer", NULL);
  if (status != CM_SUCCESS)
  return 1;
  bm_open_buffer(EVENT_BUFFER_NAME, EVENT_BUFFER_SIZE, &hbuf);
  bm_request_event(hbuf, 1, TRIGGER_ALL, GET_ALL, request_id, process_event);

  do
  {
   status = cm_yield(1000);
  } while (status != RPC_SHUTDOWN && status != SS_ABORT);
  cm_disconnect_experiment();
  return 0;
}
```

Parameters:
  buffer_name

> *buffer_ size*
> *buffer_ handle*

Returns:

6.27.1.10 INT bm_push_event (char ∗ *buffer_ name*)

Parameters:
> *buffer_ name*

Returns:

6.27.1.11 INT bm_receive_event (INT *buffer_ handle*, void ∗ *destination*, INT ∗ *buf_ size*, INT *async_ flag*)

bm_receive_event() ??

bm_-request_event() ??
bm_receive_event() ??

```
#include <stdio.h>
#include "midas.h"
void process_event(EVENT_HEADER *pheader)
{
 printf("Received event #%d\r",
 pheader->serial_number);
}
main()
{
  INT status, request_id;
  HNDLE hbuf;
  char event_buffer[1000];
  status = cm_connect_experiment("", "Sample",
  "Simple Analyzer", NULL);
  if (status != CM_SUCCESS)
   return 1;
  bm_open_buffer(EVENT_BUFFER_NAME, EVENT_BUFFER_SIZE, &hbuf);
  bm_request_event(hbuf, 1, TRIGGER_ALL, GET_ALL, request_id, NULL);

  do
  {
   size = sizeof(event_buffer);
   status = bm_receive_event(hbuf, event_buffer, &size, ASYNC);
  if (status == CM_SUCCESS)
   process_event((EVENT_HEADER *) event_buffer);
   <...do something else...>
   status = cm_yield(0);
  } while (status != RPC_SHUTDOWN &&
  status != SS_ABORT);
  cm_disconnect_experiment();
  return 0;
}
```

Parameters:

> *buffer_handle*
>
> *destination*
>
> *buf_size*
>
> *async_flag*

Returns:

6.27.1.12   INT bm_remove_event_request (INT *buffer_handle*, INT *request_id*)

Parameters:
    buffer_handle

    request_id

Returns:

6.27.1.13   INT bm_request_event (HNDLE *buffer_handle*, short int *event_id*, short int *trigger_mask*, INT *sampling_type*, HNDLE ∗ *request_id*, void(∗ *func*)(HNDLE, HNDLE, EVENT_HEADER ∗, void ∗))

                                                         bm_open_-
buffer()   ??   bm_receive_event()   ??

Parameters:
    buffer_handle   **bm_open_buffer()   ??**
    event_id

    trigger_mask

    sampling_type

request_id

                                                  bm_delete_-

        request()   **??**

func

Returns:

                          midas.h   **??**

6.27.1.14 INT bm_send_event (INT *buffer_handle*, void ∗ *source*, INT *buf_size*, INT *async_flag*)

```
char event[1000];
// create event with ID 1, trigger mask 0, size 100 bytes and serial number 1
bm_compose_event((EVENT_HEADER *) event, 1, 0, 100, 1);

// set first byte of event
*(event+sizeof(EVENT_HEADER)) = <...>
#include <stdio.h>
#include "midas.h"
main()
{
 INT status, i;
 HNDLE hbuf;
 char event[1000];
 status = cm_connect_experiment("", "Sample", "Producer", NULL);
 if (status != CM_SUCCESS)
 return 1;
 bm_open_buffer(EVENT_BUFFER_NAME, EVENT_BUFFER_SIZE, &hbuf);

 // create event with ID 1, trigger mask 0, size 100 bytes and serial number 1
 bm_compose_event((EVENT_HEADER *) event, 1, 0, 100, 1);

 // set event data
 for (i=0 ; i<100 ; i++)
 *(event+sizeof(EVENT_HEADER)+i) = i;
 // send event
 bm_send_event(hbuf, event, 100+sizeof(EVENT_HEADER), SYNC);
 cm_disconnect_experiment();
 return 0;
}
```

Parameters:

    buffer_handle   **bm_open_buffer()**   **??**

    source

    buf_size

    async_flag

Returns:

    midas.h   **??**

6.27.1.15   INT bm_set_cache_size (INT *buffer_handle*, INT *read_size*, INT *write_size*)

Parameters:

    buffer_handle   **bm_open_buffer()**   **??**

    read_size

    write_size

Returns:

6.27.1.16   INT bm_skip_event (INT *buffer_handle*)

Parameters:
    buffer_handle

Returns:

6.28   Midas Message Functions (msg_xxx)

Functions

- **cm_get_error**   *
- **cm_set_msg_print**
        *   *
- **cm_msg_log**   *
- **cm_msg_log1**   *
        *
- **cm_msg**   *
    *   *
- **cm_msg1**   *
    *   *   *
- **cm_msg_register**   *   **EVENT_-**
    HEADER *   *
- **cm_msg_retrieve**   *   *

6.28.1   Function Documentation

6.28.1.1   INT cm_get_error (INT *code*, char * *string*)

Parameters:
  code   midas.h   ??
  string

Returns:

6.28.1.2   INT cm_msg (INT *message_type*, char * *filename*, INT *line*, const char * *routine*, const char * *format*, ...)

cm_set_msg_print()   ??

Attention:

```
            \



    ...
    cm_msg(MINFO, "my program", "This is a information message only);
    cm_msg(MERROR, "my program", "This is an error message with status:%d", my_status);
    cm_msg(MTALK, "my_program", My program is Done!");
    ...
```

Parameters:

message_type   **MIDAS Macros   ??**

filename

line

routine

format

Returns:

6.28.1.3 INT cm_msg1 (INT *message_type*, char ∗ *filename*, INT *line*, const char ∗ *facility*, const char ∗ *routine*, const char ∗ *format*, ...)

cm_msg ?? cm_msg() ??

facility

For internal use only.

Attention:
\

MIDAS Macros ??

```
    ...
    cm_msg1(MINFO, "my_log_file", "my_program"," My message status:%d", status);
    ...
//----- File my_log_file.log
Thu Nov  8 17:59:28 2001 [my_program] My message status:1
```

Parameters:
message_type   MIDAS Macros   ??
filename
line
facility
routine
format

Returns:

6.28.1.4 INT cm_msg_log (INT *message_type*, const char ∗ *message*)

Attention:

Parameters:
message_type
message

Returns:

6.28.1.5   INT cm_msg_log1 (INT *message_type*, const char ** message*, const char ** facility*)

<div align="center">cm_msg()   ??</div>

For **Parameters** only.
      message_type
      message
      facility
    Returns:

6.28.1.6   INT cm_msg_register (void(** func*)(HNDLE, HNDLE, EVENT_HEADER *, void *))

-

```
void receive_message(HNDLE hBuf, HNDLE id, EVENT_HEADER *header, void *message)
{
  char str[256], *pc, *sp;
  // print message
  printf("%s\n", (char *)(message));

  printf("evID:%x Mask:%x Serial:%i Size:%d\n"
                 ,header->event_id
                 ,header->trigger_mask
                 ,header->serial_number
                 ,header->data_size);
  pc = strchr((char *)(message),']')+2;
  ...
  // skip none talking message
  if (header->trigger_mask == MT_TALK ||
      header->trigger_mask == MT_USER)
    ...
}

int main(int argc, char *argv[])
{
  ...
```

```
      // now connect to server
      status = cm_connect_experiment(host_name, exp_name, "Speaker", NULL);
      if (status != CM_SUCCESS)
        return 1;
      // Register callback for messages
      cm_msg_register(receive_message);
      ...
    }
```

Parameters:
  func

Returns:

6.28.1.7   INT cm_msg_retrieve (INT *n_message*, char ∗ *message*, INT ∗ *buf_size*)

Parameters:
  n_message

  message

  ∗*buf_size*

Returns:

6.28.1.8   INT cm_set_msg_print (INT *system_mask*, INT *user_mask*, int(∗ *func*)(const char ∗))

                                                      cm_msg()   ??

```
int message_print(const char *msg)
{
```

```
  char str[160];

  memset(str, ' ', 159);
  str[159] = 0;
  if (msg[0] == '[')
    msg = strchr(msg, ']')+2;
  memcpy(str, msg, strlen(msg));
  ss_printf(0, 20, str);
  return 0;
}
...
  cm_set_msg_print(MT_ALL, MT_ALL, message_print);
...
```

Parameters:

    system_mask

    user_mask

    func

Returns:

6.29   Midas Bank Functions (bk_xxx)

Functions

- **bk_init**   ∗
- **bk_init32**   ∗
- **bk_size**   ∗
- **bk_create**   ∗   ∗   **WORD**
  ∗
- **bk_close**   ∗   ∗
- **bk_list**   ∗   ∗
- **bk_locate**   ∗   ∗   ∗
- **bk_find   BANK_HEADER** ∗   ∗
  DWORD ∗   **DWORD** ∗   ∗∗
- **bk_iterate**   ∗   **BANK** ∗∗   ∗
- **bk_swap**   ∗

6.29.1   Function Documentation

6.29.1.1   INT bk_close (void ∗ *event*, void ∗ *pdata*)

                                    bk_create()   ??
                          bk_create()   ??

bk_close()   ??

Parameters:
   event
   pdata

Returns:

6.29.1.2   void bk_create (void ∗ *event*, const char ∗ *name*, WORD *type*, void ∗ *pdata*)

bk_close()   ??

```
INT *pdata;
bk_init(pevent);
bk_create(pevent, "ADC0", TID_INT, &pdata);
*pdata++ = 123
*pdata++ = 456
bk_close(pevent, pdata);
```

Parameters:

event

name

type   **Midas Data Types**   ??
        midas.h   ??

pdata

Returns:

6.29.1.3   INT bk_find (BANK_HEADER ∗ *pbkh*, const char ∗ *name*, DWORD ∗ *bklen*, DWORD ∗ *bktype*, void ∗∗ *pdata*)

Parameters:

pbkh

name

bklen

bktype

pdata

Returns:

6.29.1.4   void bk_init (void ∗ *event*)

           bk_init()   ??

Parameters:
     event

6.29.1.5   void bk_init32 (void ∗ *event*)

                                                                   $>$
                                       bk_init32()   ??

Parameters:
     event

Returns:

6.29.1.6   INT bk_iterate (void ∗ *event*, BANK ∗∗ *pbk*, void ∗ *pdata*)

```
typedef struct {
char    name[4];
WORD    type;
WORD    data_size;
} BANK;
```

```
BANK *pbk;
INT  size;
void *pdata;
char name[5];
pbk = NULL;
do
```

```
{
 size = bk_iterate(event, &pbk, &pdata);
 if (pbk == NULL)
  break;
 *((DWORD *)name) = *((DWORD *)(pbk)->name);
 name[4] = 0;
 printf("bank %s found\n", name);
} while(TRUE);
```

Parameters:

> *event*

> *pbk*

> *pdata*

Returns:

6.29.1.7   INT bk_list (void ∗ *event*, char ∗ *bklist*)

midas.h   ??

```
INT adc_calib(EVENT_HEADER *pheader, void *pevent)
{
  INT    n_adc, nbanks;
  WORD   *pdata;
  char   banklist[STRING_BANKLIST_MAX];

  // Display # of banks and list of banks in the event
  nbanks = bk_list(pevent, banklist);
  printf("#banks:%d List:%s\n", nbanks, banklist);

  // look for ADC0 bank, return if not present
  n_adc = bk_locate(pevent, "ADC0", &pdata);
  ...
}
```

Parameters:

> *event*

> *bklist*

Returns:

6.29.1.8   INT bk_locate (void $*$ *event*, const char $*$ *name*, void $*$ *pdata*)

Parameters:
    event

    name

    pdata

Returns:

6.29.1.9   INT bk_size (void $*$ *event*)

<div align="center">

bk_size() ??

</div>

Parameters:
    event

Returns:

6.29.1.10   INT bk_swap (void $*$ *event*, BOOL *force*)

<div align="center">

bk_init() ??

</div>

Parameters:
 event

 force

Returns:

6.30   Midas Alarm Functions (al_xxx)

Functions

- **al_trigger_alarm**   *   *
  *   *

6.30.1   Function Documentation

6.30.1.1   INT al_trigger_alarm (char * *alarm_name*, char * *alarm_message*, char * *default_class*, char * *cond_str*, INT *type*)

```
...
lazy.alarm[0] = 0;
size = sizeof(lazy.alarm);
db_get_value(hDB, pLch->hKey, "Settings/Alarm Class", lazy.alarm, &size, TID_STRING, TRUE);

// trigger alarm if defined
if (lazy.alarm[0])
  al_trigger_alarm("Tape", "Tape full...load new one!", lazy.alarm, "Tape full", AT_INTERNAL);
...
```

Parameters:

  alarm_name

  alarm_message

  default_class
                              <   >

  cond_str

  type

Returns:

6.31 Midas History Functions (hs_xxx)

Functions

- hs_set_path   *
- hs_open_file DWORD   *   *

6.31.1 Function Documentation

6.31.1.1 INT hs_open_file (DWORD *ltime*, char ∗ *suffix*, INT *mode*, int ∗ *fh*)

Parameters:
 ltime

 suffix

 mode

 fh

Returns:

6.31.1.2 INT hs_set_path (char ∗ *path*)

Parameters:
 path

Returns:

6.32   Midas Elog Functions (el_xxx)

Functions

- •   **el_submit**   ∗   ∗   ∗
     ∗   ∗   ∗   ∗   ∗
      ∗   ∗   ∗
           ∗   ∗   ∗

6.32.1   Function Documentation

6.32.1.1   INT el_submit (int *run*, char ∗ *author*, char ∗ *type*, char ∗ *system*, char ∗ *subject*, char ∗ *text*, char ∗ *reply_to*, char ∗ *encoding*, char ∗ *afilename1*, char ∗ *buffer1*, INT *buffer_size1*, char ∗ *afilename2*, char ∗ *buffer2*, INT *buffer_size2*, char ∗ *afilename3*, char ∗ *buffer3*, INT *buffer_size3*, char ∗ *tag*, INT *tag_size*)

Parameters:

   run

   author

   type

   system

   subject

   text

   reply_to

   encoding

   afilename1

   buffer1

   buffer_size1

   afilename2

   buffer2

   buffer_size2

   afilename3

   buffer3

   buffer_size3

tag

tag_ size

Returns:

6.33   Midas RPC Functions (rpc_xxx)

Functions

- rpc_register_client   *   *
- rpc_register_functions   *
  *   **
- rpc_set_option
- rpc_send_event   *

- rpc_flush_event

6.33.1   Function Documentation

6.33.1.1   INT rpc_flush_event ()

Returns:

6.33.1.2   INT rpc_register_client (char * *name*, RPC_LIST * *list*)

Parameters:
   list

   name

Returns:

6.33.1.3 INT rpc_register_functions (RPC_LIST * *new_list*, INT(* *func*)(INT, void **))

Parameters:
    new_list

    func

Returns:

6.33.1.4 INT rpc_send_event (INT *buffer_handle*, void * *source*, INT *buf_size*, INT *async_flag*)

Parameters:
    buffer_handle

    source

    buf_size

    async_flag

Returns:

6.33.1.5   INT rpc_set_option (HNDLE *hConn*, INT *item*, INT *value*)

Parameters:
  hConn

  item

  value

Returns:

6.34 Midas Dual Buffer Memory Functions (dm_xxx)

Functions

- **dm_buffer_create**

6.34.1 Function Documentation

6.34.1.1 INT dm_buffer_create (INT *size*, INT *user_max_event_size*)

Parameters:
    size

    user_max_event_size

Returns:

6.35 System Functions (ss_xxx)

Functions

- ss_thread_create * *
  *
- ss_thread_kill
- **DWORD ss_millitime**
- **DWORD ss_time**
- ss_sleep

6.35.1 Function Documentation

6.35.1.1 DWORD ss_millitime ()

```
...
DWORD start, stop:
start = ss_millitime();
  < do operations >
stop = ss_millitime();
printf("Operation took %1.3lf seconds\n",(stop-start)/1000.0);
...
```

Returns:

6.35.1.2 INT ss_sleep (INT *millisec*)

ss_time() ??

Parameters:
   millisec

Returns:

6.35.1.3 midas_thread_t ss_thread_create (INT(∗ *thread_func*)(void ∗), void ∗ *param*)

```
{ ...
  char cmd[256];
  sprintf(cmd,"%s %s %i %s/%s %1.3lf %d",lazy.commandAfter,
     lazy.backlabel, lazyst.nfiles, lazy.path, lazyst.backfile,
     lazyst.file_size/1024.0/1024.0, blockn);
  cm_msg(MINFO,"Lazy","Exec post file write script:%s",cmd);
  ss_system(cmd);
}
...
\encode
@param command Command to execute.
@return SS_SUCCESS or ss_exec() return code
*/
INT ss_system(char *command)
{




   system(command);
   return SS_SUCCESS;


}

/**dox***************************************************************/
```

```
                        /* DOXYGEN_SHOULD_SKIP_THIS */

/**********************************************************************/
/**
Creates and returns a new thread of execution.

Note the difference when calling from vxWorks versus Linux and Windows.
The parameter pointer for a vxWorks call is a VX_TASK_SPAWN structure, whereas
for Linux and Windows it is a void pointer.
Early versions returned SS_SUCCESS or SS_NO_THREAD instead of thread ID.

Example for VxWorks
\code
...
VX_TASK_SPAWN tsWatch = {"Watchdog", 100, 0, 2000,  (int) pDevice, 0, 0, 0, 0, 0, 0, 0, 0 ,0};
midas_thread_t thread_id = ss_thread_create((void *) taskWatch, &tsWatch);
if (thread_id == 0) {
  printf("cannot spawn taskWatch\n");
}
...




...
midas_thread_t thread_id = ss_thread_create((void *) taskWatch, pDevice);
if (thread_id == 0) {
  printf("cannot spawn taskWatch\n");
}
...
```

Parameters:

> *(∗thread_func)*
>
> *param*

Returns:

6.35.1.4 INT ss_thread_kill (midas_thread_t *thread_id*)

ss_thread_create()   ??

```
...
midas_thread_t thread_id = ss_thread_create((void *) taskWatch, pDevice);
if (thread_id == 0) {
  printf("cannot spawn taskWatch\n");
}
...
ss_thread_kill(thread_id);
...
```

Parameters:
   thread_id

Returns:

6.35.1.5 DWORD ss_time ()

```
...
DWORD start, stop:
start = ss_time();
  ss_sleep(12000);
stop = ss_time();
printf("Operation took %1.3lf seconds\n",stop-start);
...
```

Returns:

6.36 The msystem.h & system.c

Modules

- **System Functions (ss_xxx)**
- **System #define**
- **System Macros**
- **System Structure Declaration**

6.37 System #define

Defines

- **DRI_16** <<
- **DRI_32** <<
- **DRI_64** <<
- **DRI_LITTLE_ENDIAN** <<
- **DRI_BIG_ENDIAN** <<
- **DRF_IEEE** <<
- **DRF_G_FLOAT** <<
- **DR_ASCII** <<

6.37.1 Define Documentation

6.37.1.1 #define DR_ASCII (1<<7)

-

6.37.1.2 #define DRF_G_FLOAT (1<<6)

-

6.37.1.3 #define DRF_IEEE (1<<5)

-

6.37.1.4 #define DRI_16 (1<<0)

-

6.37.1.5   #define DRI_32 (1<<1)

-

6.37.1.6   #define DRI_64 (1<<2)

-

6.37.1.7   #define DRI_BIG_ENDIAN (1<<4)

-

6.37.1.8   #define DRI_LITTLE_ENDIAN (1<<3)

-

6.38 System Macros

Defines

- **WORD_SWAP**
- **DWORD_SWAP**
- **QWORD_SWAP**

6.38.1 Define Documentation

6.38.1.1 #define DWORD_SWAP(x)

Value:

```
{ BYTE _tmp;                            \
                _tmp= *((BYTE *)(x));                   \
                *((BYTE *)(x)) = *(((BYTE *)(x))+3);    \
                *(((BYTE *)(x))+3) = _tmp;              \
                _tmp= *(((BYTE *)(x))+1);               \
                *(((BYTE *)(x))+1) = *(((BYTE *)(x))+2); \
                *(((BYTE *)(x))+2) = _tmp; }
```

6.38.1.2 #define QWORD_SWAP(x)

Value:

```
{ BYTE _tmp;                              \
                _tmp= *((BYTE *)(x));                     \
                *((BYTE *)(x)) = *(((BYTE *)(x))+7);      \
                *(((BYTE *)(x))+7) = _tmp;                \
                _tmp= *(((BYTE *)(x))+1);                 \
                *(((BYTE *)(x))+1) = *(((BYTE *)(x))+6);  \
                *(((BYTE *)(x))+6) = _tmp;                \
                _tmp= *(((BYTE *)(x))+2);                 \
                *(((BYTE *)(x))+2) = *(((BYTE *)(x))+5);  \
                *(((BYTE *)(x))+5) = _tmp;                \
                _tmp= *(((BYTE *)(x))+3);                 \
                *(((BYTE *)(x))+3) = *(((BYTE *)(x))+4);  \
                *(((BYTE *)(x))+4) = _tmp; }
```

6.38.1.3 #define WORD_SWAP(x)

Value:

```
{ BYTE _tmp;                                   \
                    _tmp= *((BYTE *)(x));                      \
                    *((BYTE *)(x)) = *(((BYTE *)(x))+1);       \
                    *(((BYTE *)(x))+1) = _tmp; }
```

6.39 System Structure Declaration

Data Structures

- **DATABASE**
- **DATABASE_CLIENT**
- **DATABASE_HEADER**
- **FREE_DESCRIP**
- **OPEN_RECORD**
- **RECORD_LIST**
- **REQUEST_LIST**

6.40 The mrpc.h & mrpc.c

Modules

- **RPC #define**
- **Midas RPC_LIST**

6.41   RPC #define

Defines

- RPC_CM_SET_CLIENT_INFO
- RPC_CM_SET_WATCHDOG_PARAMS
- RPC_CM_CLEANUP
- RPC_CM_GET_WATCHDOG_INFO
- RPC_CM_MSG_LOG
- RPC_CM_EXECUTE
- RPC_CM_SYNCHRONIZE
- RPC_CM_ASCTIME
- RPC_CM_TIME
- RPC_CM_MSG
- RPC_CM_EXIST
- RPC_CM_MSG_RETRIEVE
- RPC_CM_MSG_LOG1
- RPC_BM_OPEN_BUFFER
- RPC_BM_CLOSE_BUFFER
- RPC_BM_CLOSE_ALL_BUFFERS
- RPC_BM_GET_BUFFER_INFO
- RPC_BM_GET_BUFFER_LEVEL
- RPC_BM_INIT_BUFFER_COUNTERS
- RPC_BM_SET_CACHE_SIZE
- RPC_BM_ADD_EVENT_REQUEST
- RPC_BM_REMOVE_EVENT_REQUEST
- RPC_BM_SEND_EVENT
- RPC_BM_FLUSH_CACHE
- RPC_BM_RECEIVE_EVENT
- RPC_BM_MARK_READ_WAITING
- RPC_BM_EMPTY_BUFFERS
- RPC_BM_SKIP_EVENT
- RPC_DB_OPEN_DATABASE
- RPC_DB_CLOSE_DATABASE
- RPC_DB_CLOSE_ALL_DATABASES
- RPC_DB_CREATE_KEY
- RPC_DB_CREATE_LINK
- RPC_DB_SET_VALUE
- RPC_DB_GET_VALUE
- RPC_DB_FIND_KEY
- RPC_DB_FIND_LINK
- RPC_DB_GET_PATH
- RPC_DB_DELETE_KEY

- RPC_DB_ENUM_KEY
- RPC_DB_GET_KEY
- RPC_DB_GET_DATA
- RPC_DB_SET_DATA
- RPC_DB_SET_DATA_INDEX
- RPC_DB_SET_MODE
- RPC_DB_GET_RECORD_SIZE
- RPC_DB_GET_RECORD
- RPC_DB_SET_RECORD
- RPC_DB_ADD_OPEN_RECORD
- RPC_DB_REMOVE_OPEN_RECORD
- RPC_DB_SAVE
- RPC_DB_LOAD
- RPC_DB_SET_CLIENT_NAME
- RPC_DB_RENAME_KEY
- RPC_DB_ENUM_LINK
- RPC_DB_REORDER_KEY
- RPC_DB_CREATE_RECORD
- RPC_DB_GET_DATA_INDEX
- RPC_DB_GET_KEY_TIME
- RPC_DB_GET_OPEN_RECORDS
- RPC_DB_FLUSH_DATABASE
- RPC_DB_SET_DATA_INDEX2
- RPC_DB_GET_KEY_INFO
- RPC_DB_GET_DATA1
- RPC_DB_SET_NUM_VALUES
- RPC_DB_CHECK_RECORD
- RPC_DB_GET_NEXT_LINK
- RPC_HS_SET_PATH
- RPC_HS_DEFINE_EVENT
- RPC_HS_WRITE_EVENT
- RPC_HS_COUNT_EVENTS
- RPC_HS_ENUM_EVENTS
- RPC_HS_COUNT_VARS
- RPC_HS_ENUM_VARS
- RPC_HS_READ
- RPC_HS_GET_VAR
- RPC_HS_GET_EVENT_ID
- RPC_EL_SUBMIT
- RPC_AL_CHECK
- RPC_AL_TRIGGER_ALARM
- RPC_RC_TRANSITION
- RPC_ANA_CLEAR_HISTOS

- RPC_LOG_REWIND
- RPC_TEST
- RPC_CNAF16
- RPC_CNAF24
- RPC_MANUAL_TRIG
- RPC_ID_WATCHDOG
- RPC_ID_SHUTDOWN
- RPC_ID_EXIT

6.41.1 Define Documentation

6.41.1.1 #define RPC_AL_CHECK 11500

-

6.41.1.2 #define RPC_AL_TRIGGER_ALARM 11501

-

6.41.1.3 #define RPC_ANA_CLEAR_HISTOS 13000

-

6.41.1.4 #define RPC_BM_ADD_EVENT_REQUEST 11107

-

6.41.1.5 #define RPC_BM_CLOSE_ALL_BUFFERS 11102

-

6.41.1.6 #define RPC_BM_CLOSE_BUFFER 11101

•

6.41.1.7 #define RPC_BM_EMPTY_BUFFERS 11113

•

6.41.1.8 #define RPC_BM_FLUSH_CACHE 11110

•

6.41.1.9 #define RPC_BM_GET_BUFFER_INFO 11103

•

6.41.1.10 #define RPC_BM_GET_BUFFER_LEVEL 11104

•

6.41.1.11 #define RPC_BM_INIT_BUFFER_COUNTERS 11105

•

6.41.1.12 **#define RPC_BM_MARK_READ_WAITING 11112**

-

6.41.1.13 **#define RPC_BM_OPEN_BUFFER 11100**

-

6.41.1.14 **#define RPC_BM_RECEIVE_EVENT 11111**

-

6.41.1.15 **#define RPC_BM_REMOVE_EVENT_REQUEST 11108**

-

6.41.1.16 **#define RPC_BM_SEND_EVENT 11109**

-

6.41.1.17 **#define RPC_BM_SET_CACHE_SIZE 11106**

-

6.41.1.18   #define RPC_BM_SKIP_EVENT 11114

-

6.41.1.19   #define RPC_CM_ASCTIME 11007

-

6.41.1.20   #define RPC_CM_CLEANUP 11002

-

6.41.1.21   #define RPC_CM_EXECUTE 11005

-

6.41.1.22   #define RPC_CM_EXIST 11011

-

6.41.1.23   #define RPC_CM_GET_WATCHDOG_INFO 11003

-

6.41.1.24 #define RPC_CM_MSG 11009

-

6.41.1.25 #define RPC_CM_MSG_LOG 11004

-

6.41.1.26 #define RPC_CM_MSG_LOG1 11013

-

6.41.1.27 #define RPC_CM_MSG_RETRIEVE 11012

-

6.41.1.28 #define RPC_CM_SET_CLIENT_INFO 11000

-

6.41.1.29 #define RPC_CM_SET_WATCHDOG_PARAMS 11001

-

6.41.1.30 #define RPC_CM_SYNCHRONIZE 11006

-

6.41.1.31 #define RPC_CM_TIME 11008

-

6.41.1.32 #define RPC_CNAF16 16000

-

6.41.1.33 #define RPC_CNAF24 16001

-

6.41.1.34 #define RPC_DB_ADD_OPEN_RECORD 11222

-

6.41.1.35 **#define RPC_DB_CHECK_RECORD 11240**

-

6.41.1.36 **#define RPC_DB_CLOSE_ALL_DATABASES 11202**

-

6.41.1.37 **#define RPC_DB_CLOSE_DATABASE 11201**

-

6.41.1.38 **#define RPC_DB_CREATE_KEY 11203**

-

6.41.1.39 **#define RPC_DB_CREATE_LINK 11204**

-

6.41.1.40 **#define RPC_DB_CREATE_RECORD 11230**

-

6.41.1.41   #define RPC_DB_DELETE_KEY 11210

-

6.41.1.42   #define RPC_DB_ENUM_KEY 11211

-

6.41.1.43   #define RPC_DB_ENUM_LINK 11228

-

6.41.1.44   #define RPC_DB_FIND_KEY 11207

-

6.41.1.45   #define RPC_DB_FIND_LINK 11208

-

6.41.1.46   #define RPC_DB_FLUSH_DATABASE 11235

-

6.41.1.47   #define RPC_DB_GET_DATA 11213

-

6.41.1.48   #define RPC_DB_GET_DATA1 11238

-

6.41.1.49   #define RPC_DB_GET_DATA_INDEX 11231

-

6.41.1.50   #define RPC_DB_GET_KEY 11212

-

6.41.1.51   #define RPC_DB_GET_KEY_INFO 11237

-

6.41.1.52   #define RPC_DB_GET_KEY_TIME 11232

-

6.41.1.53   #define RPC_DB_GET_NEXT_LINK 11241

-

6.41.1.54   #define RPC_DB_GET_OPEN_RECORDS 11233

-

6.41.1.55   #define RPC_DB_GET_PATH 11209

-

6.41.1.56   #define RPC_DB_GET_RECORD 11220

-

6.41.1.57   #define RPC_DB_GET_RECORD_SIZE 11219

-

6.41.1.58   #define RPC_DB_GET_VALUE 11206

-

6.41.1.59   #define RPC_DB_LOAD 11225

-

6.41.1.60   #define RPC_DB_OPEN_DATABASE 11200

-

6.41.1.61   #define RPC_DB_REMOVE_OPEN_RECORD 11223

-

6.41.1.62   #define RPC_DB_RENAME_KEY 11227

-

6.41.1.63   #define RPC_DB_REORDER_KEY 11229

-

6.41.1.64   #define RPC_DB_SAVE 11224

-

6.41.1.65   #define RPC_DB_SET_CLIENT_NAME 11226

-

6.41.1.66   #define RPC_DB_SET_DATA 11214

-

6.41.1.67   #define RPC_DB_SET_DATA_INDEX 11215

-

6.41.1.68   #define RPC_DB_SET_DATA_INDEX2 11236

-

6.41.1.69   #define RPC_DB_SET_MODE 11216

-

6.41.1.70   #define RPC_DB_SET_NUM_VALUES 11239

-

6.41.1.71   #define RPC_DB_SET_RECORD 11221

-

6.41.1.72   #define RPC_DB_SET_VALUE 11205

-

6.41.1.73   #define RPC_EL_SUBMIT 11400

-

6.41.1.74   #define RPC_HS_COUNT_EVENTS 11303

-

6.41.1.75   #define RPC_HS_COUNT_VARS 11305

-

6.41.1.76   #define RPC_HS_DEFINE_EVENT 11301

-

6.41.1.77 #define RPC_HS_ENUM_EVENTS 11304

-

6.41.1.78 #define RPC_HS_ENUM_VARS 11306

-

6.41.1.79 #define RPC_HS_GET_EVENT_ID 11309

-

6.41.1.80 #define RPC_HS_GET_VAR 11308

-

6.41.1.81 #define RPC_HS_READ 11307

-

6.41.1.82 #define RPC_HS_SET_PATH 11300

-

6.41.1.83 #define RPC_HS_WRITE_EVENT 11302

-

6.41.1.84 #define RPC_ID_EXIT 99999

-

6.41.1.85 #define RPC_ID_SHUTDOWN 99998

-

6.41.1.86 #define RPC_ID_WATCHDOG 99997

-

6.41.1.87 #define RPC_LOG_REWIND 14000

-

6.41.1.88 #define RPC_MANUAL_TRIG 17000

-

6.41.1.89 #define RPC_RC_TRANSITION 12000

-

6.41.1.90   #define RPC_TEST 15000

-

6.42   Midas RPC_LIST

Variables

-        **rpc_list_library**
-        **rpc_list_system**

6.42.1   Function Documentation

6.42.1.1   RPC_LIST* rpc_get_internal_list (INT *flag*)

6.42.2   Variable Documentation

6.42.2.1   RPC_LIST rpc_list_library[]   [static]

6.42.2.2   RPC_LIST rpc_list_system[]   [static]

Initial value:

```
{

  {RPC_ID_WATCHDOG, "id_watchdog",
   {{0}}},

  {RPC_ID_SHUTDOWN, "id_shutdown",
   {{0}}},

  {RPC_ID_EXIT, "id_exit",
   {{0}}},

  {0}

}
```

6.43   The odb.c

Modules

- **Midas ODB Functions (db_xxx)**

6.44 Midas ODB Functions (db_xxx)

Functions

- db_open_database $*$hDB $*$
- db_close_database hDB
- db_lock_database hDB
- db_unlock_database hDB
- db_protect_database hDB
- db_create_key hDB hKey $*$ DWORD
- db_create_link hDB hKey $*$ $*$
- db_delete_key1 hDB hKey
- db_delete_key hDB hKey
- db_find_key hDB hKey $*$ $*$
- db_set_value hDB $*$ $*$ DWORD
- db_get_value hDB $*$ $*$ $*$ DWORD
- db_enum_key hDB hKey $*$
- db_get_key hDB hKey KEY $*$
- db_get_key_time hDB hKey DWORD $*$
- db_get_key_info hDB hKey $*$ $*$ $*$ $*$
- db_get_data hDB hKey $*$ $*$ DWORD
- db_get_data_index hDB hKey $*$ $*$ DWORD
- db_set_data hDB hKey $*$ DWORD
- db_set_data_index hDB hKey $*$ DWORD
- db_load hDB $*$
- db_copy hDB hKey $*$ $*$ $*$
- db_paste hDB $*$

- db_save   hDB   hKey   ∗

- db_save_struct   hDB   hKey   ∗
  ∗

- db_sprintf   ∗   ∗
DWORD

- db_get_record_size   hDB   hKey
  ∗

- db_get_record   hDB   hKey   ∗
  ∗

- db_set_record   hDB   hKey   ∗

- db_create_record   hDB   hKey   ∗
                ∗

- db_check_record   hDB   hKey   ∗
  ∗

- db_open_record   hDB   hKey   ∗
        WORD   ∗   ∗
  ∗

- db_close_record   hDB   hKey

- db_close_all_records

- db_update_record   hDB   hKey

- db_send_changed_records

6.44.1 Function Documentation

6.44.1.1 INT db_check_record (HNDLE *hDB*, HNDLE *hKey*, char ∗ *keyname*, char ∗ *rec_str*, BOOL *correct*)

db_create_record()   ??

Parameters:

   hDB   cm_get_experiment_-
     database()   ??

   hKey

   keyname

   rec_str

   correct

Returns:

6.44.1.2   INT db_close_all_records ()

cm_disconnect_experiment()   ??

Returns:

6.44.1.3   INT db_close_database (HNDLE *hDB*)

Parameters:
  hDB   cm_get_experiment_-
       database()   ??

Returns:

6.44.1.4   INT db_close_record (HNDLE *hDB*, HNDLE *hKey*)

Parameters:
  hDB   cm_get_experiment_-
       database()   ??
  hKey

Returns:

6.44.1.5　INT db_copy (HNDLE *hDB*, HNDLE *hKey*, char ∗ *buffer*, INT ∗ *buffer_size*, char ∗ *path*)

db_paste()　**??**

　　　　　　　　　　　　　　db_load()　**??**　　**db_save()**　**??**

　　　　　　db_copy()　**??**　　**db_paste()**　**??**

-

```
[ODB path]
 key name = type : value
```

-

```
key name = STRING : [size] string contents
```

-

```
key name = type[size] :
 [0] value0
 [1] value1
 [2] value2
 ...
```

Parameters:

　　hDB　　　　　　　　　　　　　　　　**cm_get_experiment_-database()**　**??**

　　hKey

　　buffer

　　buffer_size

　　path

Returns:

6.44.1.6 INT db_create_key (HNDLE *hDB*, HNDLE *hKey*, char * *key_name*, DWORD *type*)

Parameters:
  hDB   cm_get_experiment_-
    database() ??
  hKey
  key_name
  type   Midas Data Types ??

Returns:

6.44.1.7 INT db_create_link (HNDLE *hDB*, HNDLE *hKey*, char * *link_name*, char * *destination*)

Parameters:
  hDB   cm_get_experiment_-
    database() ??
  hKey
  link_name
  destination

Returns:

6.44.1.8 INT db_create_record (HNDLE *hDB*, HNDLE *hKey*, char * *orig_key_name*, char * *init_str*)

db_copy()   ??

db_open_-
record()   ??

db_create_record()   ??

```
struct {
  INT level1;
  INT level2;
} trigger_settings;
char *trigger_settings_str =
"[Settings]\n\
level1 = INT : 0\n\
level2 = INT : 0";
void trigger_update(INT hDB, INT hkey, void *info)
{
  printf("New levels: %d %d\n",
    trigger_settings.level1,
    trigger_settings.level2);
}
main()
{
  HNDLE hDB, hkey;
  char[128] info;
  ...
  cm_get_experiment_database(&hDB, NULL);
  db_create_record(hDB, 0, "/Equipment/Trigger", trigger_settings_str);
  db_find_key(hDB, 0,"/Equipment/Trigger/Settings", &hkey);
  db_open_record(hDB, hkey, &trigger_settings,
    sizeof(trigger_settings), MODE_READ, trigger_update, info);
  ...
}
```

Parameters:
  hDB   **cm_get_experiment_-**
      database()   ??

  hKey

  orig_key_name

init_str

Returns:

6.44.1.9 INT db_delete_key (HNDLE *hDB*, HNDLE *hKey*, BOOL *follow_links*)

```
...
   status = db_find_link(hDB, 0, str, &hkey);
   if (status != DB_SUCCESS)
   {
     cm_msg(MINFO,"my_delete"," "Cannot find key %s", str);
     return;
   }

   status = db_delete_key(hDB, hkey, FALSE);
   if (status != DB_SUCCESS)
   {
     cm_msg(MERROR,"my_delete"," "Cannot delete key %s", str);
     return;
   }
 ...
```

Parameters:

   hDB   **cm_get_experiment_-**
       database()   **??**

   hKey

   follow_links

Returns:

6.44.1.10   INT db_delete_key1 (HNDLE *hDB*, HNDLE *hKey*, INT *level*, BOOL *follow_links*)

db_-delete_key() ??

For Parameters:use only.

    hDB   **cm_get_experiment_-database()** ??

    hKey

    level

    follow_links

  Returns:

6.44.1.11   INT db_enum_key (HNDLE *hDB*, HNDLE *hKey*, INT *index*, HNDLE * *subkey_handle*)

db_get_key()   ??

```
INT   i;
HNDLE hkey, hsubkey;
KEY   key;
 db_find_key(hdb, 0, "/Runinfo", &hkey);
 for (i=0 ; ; i++)
 {
  db_enum_key(hdb, hkey, i, &hsubkey);
  if (!hSubkey)
   break; // end of list reached
  // print key name
  db_get_key(hdb, hkey, &key);
  printf("%s\n", key.name);
 }
```

Parameters:

    hDB   **cm_get_experiment_-database()** ??

    hKey

index

subkey_handle   **db_get_-**
    key()   ??   db_get_data()   ??

Returns:

6.44.1.12   INT db_find_key (HNDLE *hDB*, HNDLE *hKey*, char *∗ key_ name*, HNDLE *∗ subhKey*)

db_find_key()   ??

```
HNDLE hkey, hsubkey;
// use full name, start from root
db_find_key(hDB, 0, "/Runinfo/Run number", &hkey);
// start from subdirectory
db_find_key(hDB, 0, "/Runinfo", &hkey);
db_find_key(hdb, hkey, "Run number", &hsubkey);
```

Parameters:
    hDB   **cm_get_experiment_-**
        database()   ??

    hKey

    key_ name

    subhKey

Returns:

6.44.1.13   INT db_get_data (HNDLE *hDB*, HNDLE *hKey*, void ∗ *data*, INT ∗ *buf_size*, DWORD *type*)

```
HNLDE hkey;
INT   run_number, size;
// get key handle for run number
db_find_key(hDB, 0, "/Runinfo/Run number", &hkey);
// return run number
size = sizeof(run_number);
db_get_data(hDB, hkey, &run_number, &size,TID_INT);
```

Parameters:

   hDB   **cm_get_experiment_-database()**   **??**

   hKey

   data

   buf_size

   type   **Midas Data Types**   **??**

Returns:

6.44.1.14 INT db_get_data_index (HNDLE *hDB*, HNDLE *hKey*, void ∗ *data*, INT ∗ *buf_size*, INT *index*, DWORD *type*)

Parameters:
> *hDB*   cm_get_experiment_-
>   database()   ??
>
> *hKey*
>
> *data*
>
> *buf_size*
>
> *index*
>
> *type*   Midas Data Types   ??

Returns:

6.44.1.15 INT db_get_key (HNDLE *hDB*, HNDLE *hKey*, KEY ∗ *key*)

KEY ??

```
typedef struct {
  DWORD        type;                // TID_xxx type
  INT          num_values;          // number of values
  char         name[NAME_LENGTH];   // name of variable
  INT          data;                // Address of variable (offset)
  INT          total_size;          // Total size of data block
  INT          item_size;           // Size of single data item
  WORD         access_mode;         // Access mode
  WORD         notify_count;        // Notify counter
  INT          next_key;            // Address of next key
  INT          parent_keylist;      // keylist to which this key belongs
  INT          last_written;        // Time of last write action
} KEY;
```

```
KEY    key;
HNDLE hkey;
db_find_key(hDB, 0, "/Runinfo/Run number", &hkey);
db_get_key(hDB, hkey, &key);
printf("The run number is of type %s\n", rpc_tid_name(key.type));
```

Parameters:

> *hDB*   **cm_get_experiment_-**
>   **database()**   **??**

> *hKey*

> *key*   **KEY**   **??**

Returns:

6.44.1.16 **INT db_get_key_info (HNDLE *hDB*, HNDLE *hKey*, char $*$ *name*, INT *name_size*, INT $*$ *type*, INT $*$ *num_values*, INT $*$ *item_size*)**

Parameters:

> *hDB*   **cm_get_experiment_-**
>   **database()**   **??**

> *hKey*

> *name*

> *name_size*

> *type*   **Midas Data Types**   **??**

> *num_values*

> *item_size*

Returns:

6.44.1.17 INT db_get_key_time (HNDLE *hDB*, HNDLE *hKey*, DWORD * *delta*)

Parameters:

    hDB   **cm_get_experiment_-**

       database()   **??**

    hKey

    delta

Returns:

6.44.1.18 INT db_get_record (HNDLE *hDB*, HNDLE *hKey*, void * *data*, INT * *buf_size*, INT *align*)

               db_open_record()   **??**

           db_create_record()   **??**   **db_get_record()**   **??**

```
struct {
  INT level1;
  INT level2;
} trigger_settings;
char *trigger_settings_str =
"[Settings]\n\
level1 = INT : 0\n\
level2 = INT : 0";

main()
{
  HNDLE hDB, hkey;
  INT   size;
  ...
  cm_get_experiment_database(&hDB, NULL);
  db_create_record(hDB, 0, "/Equipment/Trigger", trigger_settings_str);
  db_find_key(hDB, 0, "/Equipment/Trigger/Settings", &hkey);
  size = sizeof(trigger_settings);
```

```
  db_get_record(hDB, hkey, &trigger_settings, &size, 0);
  ...
}
```

Parameters:

    hDB   **cm_get_experiment_-**
        database()   **??**

    hKey

    data

    buf_size

    align

Returns:

6.44.1.19 INT db_get_record_size (HNDLE *hDB*, HNDLE *hKey*, INT *align*, INT ∗ *buf_size*)

Parameters:

    hDB   **cm_get_experiment_-**
        database()   **??**

    hKey

    align

    buf_size

Returns:

6.44.1.20 **INT db_get_value (HNDLE *hDB*, HNDLE *hKeyRoot*, char * *key_name*, void * *data*, INT * *buf_size*, DWORD *type*, BOOL *create*)**

```
INT level1, size;
  size = sizeof(level1);
  db_get_value(hDB, 0, "/Equipment/Trigger/Settings/Level1",
                          &level1, &size, TID_INT, 0);
```

Parameters:

> *hDB* cm_get_experiment_-
>> database() ??
>
> *hKeyRoot*
>
> *key_name*
>
> *data*
>
> *buf_size*
>
> *type* Midas Data Types ??
>
> *create*

Returns:

6.44.1.21   INT db_load (HNDLE *hDB*, HNDLE *hKeyRoot*, char ∗ *filename*, BOOL *bRemote*)

db_copy()   ??

Parameters:
   hDB   cm_get_experiment_-
      database()   ??
   hKeyRoot
   filename
   bRemote

Returns:

6.44.1.22   INT db_lock_database (HNDLE *hDB*)

Parameters:
   hDB

Returns:

6.44.1.23   INT db_open_database (char ∗ *database_name*, INT *database_size*, HNDLE ∗ *hDB*, char ∗ *client_name*)

Parameters:

database_ name

database_ size

client_ name

hDB   **cm_ get_ experiment_ - database()**   **??**

Returns:

6.44.1.24 INT db_open_record (HNDLE *hDB*, HNDLE *hKey*, void ∗ *ptr*, INT *rec_ size*, WORD *access_ mode*, void(∗ *dispatcher*)(INT, INT, void ∗), void ∗ *info*)

db_create_record()   **??**   **db_open_record()**   **??**

db_send_changed_records()   **??**

db_close_ - record()   **??**

-

```
struct {
  INT level1;
  INT level2;
} trigger_settings;
char *trigger_settings_str =
"[Settings]\n\
level1 = INT : 0\n\
level2 = INT : 0";
main()
{
  HNDLE hDB, hkey, i=0;
  ...
  cm_get_experiment_database(&hDB, NULL);
  db_create_record(hDB, 0, "/Equipment/Trigger", trigger_settings_str);
  db_find_key(hDB, 0,"/Equipment/Trigger/Settings", &hkey);
  db_open_record(hDB, hkey, &trigger_settings, sizeof(trigger_settings)
                 , MODE_WRITE, NULL);
  do
  {
    trigger_settings.level1 = i++;
    db_send_changed_records()
    status = cm_yield(1000);
  } while (status != RPC_SHUTDOWN && status != SS_ABORT);
  ...
}
```

Parameters:

> *hDB*   **cm_get_experiment_-**
>   database()   ??
>
> *hKey*
>
> *ptr*
>
>
>
> *rec_size*
> *access_mode*
>
>
> (∗*dispatcher*)
>
>
>   ∗
>
> *info*

Returns:

6.44.1.25 INT db_paste (HNDLE *hDB*, HNDLE *hKeyRoot*, char ∗ *buffer*)

Parameters:

  hDB   cm_get_experiment_-
       database()   ??

  hKeyRoot

  buffer

Returns:

6.44.1.26 INT db_protect_database (HNDLE *hDB*)

db_xxx

Parameters:

  hDB   cm_get_experiment_-
       database()   ??

Returns:

6.44.1.27 INT db_save (HNDLE *hDB*, HNDLE *hKey*, char ∗ *filename*, BOOL *bRemote*)

       db_copy()   ??

Parameters:

  hDB   cm_get_experiment_-
       database()   ??

  hKey

filename

bRemote

Returns:

6.44.1.28 INT db_save_struct (HNDLE *hDB*, HNDLE *hKey*, char * *file_name*, char * *struct_name*, BOOL *append*)

Parameters:

hDB cm_get_experiment_- database() ??

hKey

file_name

struct_name

append

Returns:

6.44.1.29 INT db_send_changed_records ()

db_open_record() ??

*

```
gcc -DOS_LINUX -I/midas/include -o dbchange dbchange.c
/midas/linux/lib/libmidas.a -lutil}

\begin{verbatim}
//------- dbchange.c
#include "midas.h"
#include "msystem.h"
```

```
//-------- BOF dbchange.c
typedef struct {
    INT     my_number;
    float   my_rate;
} MY_STATISTICS;

MY_STATISTICS myrec;

#define MY_STATISTICS(_name) char *_name[] = {\
"My Number = INT : 0",\
"My Rate = FLOAT : 0",\
"",\
NULL }

HNDLE hDB, hKey;

// Main
int main(unsigned int argc,char **argv)
{
  char      host_name[HOST_NAME_LENGTH];
  char      expt_name[HOST_NAME_LENGTH];
  INT       lastnumber, status, msg;
  BOOL      debug=FALSE;
  char      i, ch;
  DWORD     update_time, mainlast_time;
  MY_STATISTICS (my_stat);

  // set default
  host_name[0] = 0;
  expt_name[0] = 0;

  // get default
  cm_get_environment(host_name, sizeof(host_name), expt_name, sizeof(expt_name));

  // get parameters
  for (i=1 ; i<argc ; i++)
  {
    if (argv[i][0] == '-' && argv[i][1] == 'd')
      debug = TRUE;
    else if (argv[i][0] == '-')
    {
      if (i+1 >= argc || argv[i+1][0] == '-')
        goto usage;
      if (strncmp(argv[i],"-e",2) == 0)
        strcpy(expt_name, argv[++i]);
      else if (strncmp(argv[i],"-h",2)==0)
        strcpy(host_name, argv[++i]);
    }
    else
    {
  usage:
      printf("usage: dbchange [-h <Hostname>] [-e <Experiment>]\n");
      return 0;
    }
  }

  // connect to experiment
```

```
status = cm_connect_experiment(host_name, expt_name, "dbchange", 0);
if (status != CM_SUCCESS)
  return 1;

// Connect to DB
cm_get_experiment_database(&hDB, &hKey);

// Create a default structure in ODB
db_create_record(hDB, 0, "My statistics", strcomb(my_stat));

// Retrieve key for that strucutre in ODB
if (db_find_key(hDB, 0, "My statistics", &hKey) != DB_SUCCESS)
{
  cm_msg(MERROR, "mychange", "cannot find My statistics");
  goto error;
}

// Hot link this structure in Write mode
status = db_open_record(hDB, hKey, &myrec
                           , sizeof(MY_STATISTICS), MODE_WRITE, NULL, NULL);
if (status != DB_SUCCESS)
{
  cm_msg(MERROR, "mychange", "cannot open My statistics record");
  goto error;
}

// initialize ss_getchar()
ss_getchar(0);

// Main loop
do
{
  // Update local structure
  if ((ss_millitime() - update_time) > 100)
  {
    myrec.my_number += 1;
    if (myrec.my_number - lastnumber) {
      myrec.my_rate = 1000.f * (float) (myrec.my_number - lastnumber)
        / (float) (ss_millitime() - update_time);
    }
    update_time = ss_millitime();
    lastnumber = myrec.my_number;
  }

  // Publish local structure to ODB (db_send_changed_record)
  if ((ss_millitime() - mainlast_time) > 5000)
  {
    db_send_changed_records();                        // <------- Call
    mainlast_time = ss_millitime();
  }

  // Check for keyboard interaction
  ch = 0;
  while (ss_kbhit())
  {
    ch = ss_getchar(0);
    if (ch == -1)
```

```
        ch = getchar();
      if ((char) ch == '!')
        break;
    }
    msg = cm_yield(20);
  } while (msg != RPC_SHUTDOWN && msg != SS_ABORT && ch != '!');

 error:
  cm_disconnect_experiment();
  return 1;
}
//-------- EOF dbchange.c
```

Returns:

6.44.1.30 INT db_set_data (HNDLE *hDB*, HNDLE *hKey*, void ∗ *data*, INT *buf_size*, INT *num_values*, DWORD *type*)

```
HNLDE hkey;
 INT   run_number;
 // get key handle for run number
 db_find_key(hDB, 0, "/Runinfo/Run number", &hkey);
 // set run number
 db_set_data(hDB, hkey, &run_number, sizeof(run_number),TID_INT);
```

Parameters:

> ***hDB***   **cm_get_experiment_- database()**   **??**
>
> ***hKey***
>
> ***data***
>
> ***buf_size***
>
> ***num_values***
>
> ***type***   **Midas Data Types**   **??**

Returns:

6.44.1.31 INT db_set_data_index (HNDLE *hDB*, HNDLE *hKey*, void * *data*, INT *data_size*, INT *index*, DWORD *type*)

Parameters:

  hDB   cm_get_experiment_-
      database()   ??

  hKey

  data

  data_size

  index

  type   Midas Data Types   ??

Returns:

6.44.1.32 INT db_set_record (HNDLE *hDB*, HNDLE *hKey*, void * *data*, INT *buf_size*, INT *align*)

              db_open_record()   ??

              db_create_record()   ??

```
...
 memset(&lazyst,0,size);
 if (db_find_key(hDB, pLch->hKey, "Statistics",&hKeyst) == DB_SUCCESS)
   status = db_set_record(hDB, hKeyst, &lazyst, size, 0);
 else
   cm_msg(MERROR,"task","record %s/statistics not found", pLch->name)
...
```

Parameters:

 hDB   **cm_get_experiment_-**
  database()   **??**

 hKey

 data

 buf_size

 align

Returns:

6.44.1.33 INT db_set_value (HNDLE *hDB*, HNDLE *hKeyRoot*, char ∗ *key_name*, void ∗ *data*, INT *data_size*, INT *num_values*, DWORD *type*)

```
INT level1;
  db_set_value(hDB, 0, "/Equipment/Trigger/Settings/Level1",
                       &level1, sizeof(level1), 1, TID_INT);
```

Parameters:

 hDB   **cm_get_experiment_-**
  database()   **??**

 hKeyRoot

 key_name

 data

> *data_size*
> *num_values*
> *type*   **Midas Data Types**   **??**

Returns:

6.44.1.34 INT db_sprintf (char ∗ *string*, void ∗ *data*, INT *data_size*, INT *index*, DWORD *type*)

```
...
  for (j=0 ; j<key.num_values ; j++)
  {
    db_sprintf(pbuf, pdata, key.item_size, j, key.type);
    strcat(pbuf, "\n");
  }
  ...
```

Parameters:
> *string*
>
> *data*
>
> *data_size*
>
> *index*
>
> *type*   **Midas Data Types**   **??**

Returns:

6.44.1.35 INT db_unlock_database (HNDLE *hDB*)

Parameters:
   hDB

Returns:

6.44.1.36 INT db_update_record (INT *hDB*, INT *hKey*, int *socket*)

Parameters:
   hDB   cm_get_experiment_-
      database()   ??
   hKey
   socket

Returns:

6.44.1.37 BOOL equal_ustring (char * *str1*, char * *str2*)

6.44.1.38   char∗ extract_key (char ∗ *key_list*, char ∗ *key_name*)

Chapter 7

Midas Data Structure Documentation

7.1 ADC0_BANK Struct Reference

7.1.1 Field Documentation

7.1.1.1 WORD ADC0_BANK::adc0

7.1.1.2 WORD ADC0_BANK::adc1

7.1.1.3 WORD ADC0_BANK::adc2

7.1.1.4 WORD ADC0_BANK::adc3

7.2 ADC_CALIBRATION_PARAM Struct Reference

7.2.1 Field Documentation

7.2.1.1 double ADC_CALIBRATION_PARAM::histo_threshold

7.2.1.2 INT ADC_CALIBRATION_PARAM::pedestal[8]

7.2.1.3 float ADC_CALIBRATION_PARAM::software_gain[8]

7.3 ADC_SUMMING_PARAM Struct Reference

7.3.1 Field Documentation

7.3.1.1 float ADC_SUMMING_PARAM::adc_threshold

7.4   ALARM Struct Reference

7.4.1   Detailed Description

7.4.2   Field Documentation

7.4.2.1   BOOL ALARM::active

7.4.2.2   char ALARM::alarm_class[32]

7.4.2.3   char ALARM::alarm_message[80]

7.4.2.4   INT ALARM::check_interval

7.4.2.5   DWORD ALARM::checked_last

7.4.2.6   char ALARM::condition[256]

7.4.2.7   char ALARM::time_triggered_first[32]

7.4.2.8   char ALARM::time_triggered_last[32]

7.4.2.9   INT ALARM::triggered

7.4.2.10   INT ALARM::type

7.5   ALARM_CLASS Struct Reference

7.5.1   Detailed Description

7.5.2   Field Documentation

7.5.2.1   char ALARM_CLASS::display_bgcolor[32]

7.5.2.2   char ALARM_CLASS::display_fgcolor[32]

7.5.2.3   char ALARM_CLASS::execute_command[256]

7.5.2.4   INT ALARM_CLASS::execute_interval

7.5.2.5   DWORD ALARM_CLASS::execute_last

7.5.2.6   BOOL ALARM_CLASS::stop_run

7.5.2.7   INT ALARM_CLASS::system_message_interval

7.5.2.8   DWORD ALARM_CLASS::system_message_last

7.5.2.9 BOOL ALARM_CLASS::write_elog_message

7.5.2.10 BOOL ALARM_CLASS::write_system_message

7.6 ANA_MODULE Struct Reference

Data Fields

- **name**
- **author**
- **∗ analyzer EVENT_HEADER ∗ ∗**
- **∗ bor run_number**
- **∗ eor run_number**
- **∗ init**
- **∗ exit**
- **∗ parameters**
- **param_size**
- **∗∗ init_str**
- **enabled**

7.6.1 Field Documentation

7.6.1.1 INT(∗ ANA_MODULE::analyzer)(EVENT_HEADER ∗, void ∗)

7.6.1.2 char ANA_MODULE::author[NAME_LENGTH]

7.6.1.3 INT(∗ ANA_MODULE::bor)(INT run_number)

7.6.1.4 BOOL ANA_MODULE::enabled

7.6.1.5 INT(∗ ANA_MODULE::eor)(INT run_number)

7.6.1.6   INT(∗ ANA_MODULE::exit)()

7.6.1.7   INT(∗ ANA_MODULE::init)()

7.6.1.8   char∗∗ ANA_MODULE::init_str

7.6.1.9   char ANA_MODULE::name[NAME_LENGTH]

7.6.1.10   INT ANA_MODULE::param_size

7.6.1.11   void∗ ANA_MODULE::parameters

7.7 ANA_TEST Struct Reference

7.7.1 Field Documentation

7.7.1.1 DWORD ANA_TEST::count

7.7.1.2 char ANA_TEST::name[80]

7.7.1.3 BOOL ANA_TEST::registered

7.7.1.4 BOOL ANA_TEST::value

7.8 ANALYZE_REQUEST Struct Reference

Data Fields

- event_name
- AR_INFO ar_info
- *analyzer EVENT_HEADER * *
- ANA_MODULE ** ana_module
- BANK_LIST * bank_list
- rwnt_buffer_size
- use_tests
- status
- buffer_handle
- request_id
- hkey_variables
- hkey_common
- *addr
- DWORD events_received
- DWORD events_written

7.8.1 Field Documentation

7.8.1.1 void* ANALYZE_REQUEST::addr

7.8.1.2 ANA_MODULE** ANALYZE_REQUEST::ana_module

7.8.1.3 INT(* ANALYZE_REQUEST::analyzer)(EVENT_-HEADER *, void *)

7.8.1.4 AR_INFO ANALYZE_REQUEST::ar_info

7.8.1.5 AR_STATS ANALYZE_REQUEST::ar_stats

7.8.1.6 BANK_LIST∗ ANALYZE_REQUEST::bank_list

7.8.1.7 HNDLE ANALYZE_REQUEST::buffer_handle

7.8.1.8 char ANALYZE_REQUEST::event_name[NAME_-LENGTH]

7.8.1.9 DWORD ANALYZE_REQUEST::events_received

7.8.1.10 DWORD ANALYZE_REQUEST::events_written

7.8.1.11 HNDLE ANALYZE_REQUEST::hkey_common

7.8.1.12 HNDLE ANALYZE_REQUEST::hkey_variables

7.8.1.13 char∗∗ ANALYZE_REQUEST::init_string

7.8.1.14 struct { ... } ANALYZE_REQUEST::number

7.8.1.15 HNDLE ANALYZE_REQUEST::request_id

7.8.1.16 DWORD ANALYZE_REQUEST::run

<

7.8.1.17 INT ANALYZE_REQUEST::rwnt_buffer_size

7.8.1.18 DWORD ANALYZE_REQUEST::serial

7.8.1.19 INT ANALYZE_REQUEST::status

7.8.1.20 DWORD ANALYZE_REQUEST::time

7.8.1.21 BOOL ANALYZE_REQUEST::use_tests

7.9 AR_INFO Struct Reference

Data Fields

- event_id
- trigger_mask
- sampling_type
- buffer
- enabled
- client_name
- host

7.9.1 Field Documentation

7.9.1.1 char AR_INFO::buffer[NAME_LENGTH]

7.9.1.2 char AR_INFO::client_name[NAME_LENGTH]

7.9.1.3 BOOL AR_INFO::enabled

7.9.1.4 INT AR_INFO::event_id

7.9.1.5 char AR_INFO::host[NAME_LENGTH]

7.9.1.6   INT AR_INFO::sampling_type

7.9.1.7   INT AR_INFO::trigger_mask

7.10 AR_STATS Struct Reference

7.10.1 Field Documentation

7.10.1.1 double AR_STATS::events_per_sec

7.10.1.2 double AR_STATS::events_received

7.10.1.3 double AR_STATS::events_written

7.11 ASUM_BANK Struct Reference

7.11.1 Field Documentation

7.11.1.1 float ASUM_BANK::average

7.11.1.2 float ASUM_BANK::sum

7.12 BANK Struct Reference

Data Fields

- name
- **WORD type**
- **WORD data_size**

7.12.1 Field Documentation

7.12.1.1 WORD BANK::data_size

-

7.12.1.2 char BANK::name[4]

-

7.12.1.3 WORD BANK::type

-

7.13 BANK32 Struct Reference

Data Fields

- name
- **DWORD type**
- **DWORD data_size**

7.13.1 Field Documentation

7.13.1.1 DWORD BANK32::data_size

-

7.13.1.2 char BANK32::name[4]

-

7.13.1.3 DWORD BANK32::type

-

7.14 BANK_HEADER Struct Reference

Data Fields

- **DWORD data_size**
- **DWORD flags**

7.14.1 Field Documentation

7.14.1.1 DWORD BANK_HEADER::data_size

7.14.1.2 DWORD BANK_HEADER::flags

7.15 BANK_LIST Struct Reference

Data Fields

- name
- **WORD type**
- **DWORD size**
- ∗∗ init_str
- output_flag
- ∗ addr
- **DWORD n_data**
- def_key

7.15.1 Field Documentation

7.15.1.1 void∗ BANK_LIST::addr

-

7.15.1.2 HNDLE BANK_LIST::def_key

-

7.15.1.3 char∗∗ BANK_LIST::init_str

-

7.15.1.4 DWORD BANK_LIST::n_data

-

7.15.1.5 char BANK_LIST::name[9]

-

7.15.1.6 BOOL BANK_LIST::output_flag

-

7.15.1.7 DWORD BANK_LIST::size

-

7.15.1.8 WORD BANK_LIST::type

-

7.16 BUFFER Struct Reference

Data Fields

- attached
- client_index
- BUFFER_HEADER ∗ buffer_header
- ∗ buffer_data
- ∗ read_cache
- read_cache_size
- read_cache_rp
- read_cache_wp
- ∗ write_cache
- write_cache_size
- write_cache_rp
- write_cache_wp
- mutex
- shm_handle
- index
- callback

7.16.1 Field Documentation

7.16.1.1 BOOL BUFFER::attached

7.16.1.2 void∗ BUFFER::buffer_data

7.16.1.3 BUFFER_HEADER∗ BUFFER::buffer_header

7.16.1.4   BOOL BUFFER::callback

7.16.1.5   INT BUFFER::client_index

7.16.1.6   INT BUFFER::index

7.16.1.7   HNDLE BUFFER::mutex

7.16.1.8   char∗ BUFFER::read_cache

7.16.1.9   INT BUFFER::read_cache_rp

7.16.1.10   INT BUFFER::read_cache_size

7.16.1.11   INT BUFFER::read_cache_wp

7.16.1.12   INT BUFFER::shm_handle

7.16.1.13   char∗ BUFFER::write_cache

7.16.1.14   INT BUFFER::write_cache_rp

7.16.1.15   INT BUFFER::write_cache_size

7.16.1.16 INT BUFFER::write_cache_wp

7.17 BUFFER_CLIENT Struct Reference

Data Fields

- name
- pid
- tid
- thandle
- port
- read_pointer
- max_request_index
- num_received_events
- num_sent_events
- num_waiting_events
- data_rate
- read_wait
- write_wait
- wake_up
- all_flag
- DWORD last_activity
- DWORD watchdog_timeout

7.17.1 Field Documentation

7.17.1.1 BOOL BUFFER_CLIENT::all_flag

7.17.1.2 float BUFFER_CLIENT::data_rate

7.17.1.3 EVENT_REQUEST BUFFER_CLIENT::event_-request[MAX_EVENT_REQUESTS]

7.17.1.4   DWORD BUFFER_CLIENT::last_activity

7.17.1.5   INT BUFFER_CLIENT::max_request_index

7.17.1.6   char BUFFER_CLIENT::name[NAME_LENGTH]

7.17.1.7   INT BUFFER_CLIENT::num_received_events

7.17.1.8   INT BUFFER_CLIENT::num_sent_events

7.17.1.9   INT BUFFER_CLIENT::num_waiting_events

7.17.1.10   INT BUFFER_CLIENT::pid

7.17.1.11   INT BUFFER_CLIENT::port

7.17.1.12   INT BUFFER_CLIENT::read_pointer

7.17.1.13   BOOL BUFFER_CLIENT::read_wait

7.17.1.14   INT BUFFER_CLIENT::thandle

7.17.1.15   INT BUFFER_CLIENT::tid

7.17.1.16 BOOL BUFFER_CLIENT::wake_up

7.17.1.17 DWORD BUFFER_CLIENT::watchdog_timeout

7.17.1.18 INT BUFFER_CLIENT::write_wait

7.18   BUFFER_HEADER Struct Reference

Data Fields

- name
- num_clients
- max_client_index
- size
- read_pointer
- write_pointer
- num_in_events
- num_out_events
- BUFFER_CLIENT client

7.18.1   Field Documentation

7.18.1.1   BUFFER_CLIENT BUFFER_HEADER::client[MAX_-CLIENTS]

7.18.1.2   INT BUFFER_HEADER::max_client_index

7.18.1.3   char BUFFER_HEADER::name[NAME_LENGTH]

7.18.1.4 INT BUFFER_HEADER::num_clients

7.18.1.5 INT BUFFER_HEADER::num_in_events

7.18.1.6 INT BUFFER_HEADER::num_out_events

7.18.1.7 INT BUFFER_HEADER::read_pointer

7.18.1.8 INT BUFFER_HEADER::size

7.18.1.9 INT BUFFER_HEADER::write_pointer

7.19 BUS_DRIVER Struct Reference

Data Fields

- name
- ∗ bd
- ∗ bd_info

7.19.1 Field Documentation

7.19.1.1 INT(∗ BUS_DRIVER::bd)(INT cmd, ...)

7.19.1.2 void∗ BUS_DRIVER::bd_info

7.19.1.3 char BUS_DRIVER::name[NAME_LENGTH]

7.20 DATABASE Struct Reference

7.20.1 Field Documentation

7.20.1.1 BOOL DATABASE::attached

7.20.1.2 INT DATABASE::client_index

7.20.1.3 void∗ DATABASE::database_data

7.20.1.4 DATABASE_HEADER∗ DATABASE::database_header

7.20.1.5 INT DATABASE::index

7.20.1.6 INT DATABASE::lock_cnt

7.20.1.7 HNDLE DATABASE::mutex

7.20.1.8 char DATABASE::name[NAME_LENGTH]

7.20.1.9 BOOL DATABASE::protect

7.20.1.10   HNDLE DATABASE::shm_handle

7.21 DATABASE_CLIENT Struct Reference

7.21.1 Field Documentation

7.21.1.1 DWORD DATABASE_CLIENT::last_activity

7.21.1.2 INT DATABASE_CLIENT::max_index

7.21.1.3 char DATABASE_CLIENT::name[NAME_LENGTH]

7.21.1.4 INT DATABASE_CLIENT::num_open_records

7.21.1.5 OPEN_RECORD DATABASE_CLIENT::open_-record[MAX_OPEN_RECORDS]

7.21.1.6 INT DATABASE_CLIENT::pid

7.21.1.7   INT DATABASE_CLIENT::port

7.21.1.8   INT DATABASE_CLIENT::thandle

7.21.1.9   INT DATABASE_CLIENT::tid

7.21.1.10   DWORD DATABASE_CLIENT::watchdog_timeout

7.22 DATABASE_HEADER Struct Reference

7.22.1 Field Documentation

7.22.1.1 DATABASE_CLIENT DATABASE_- HEADER::client[MAX_CLIENTS]

7.22.1.2 INT DATABASE_HEADER::data_size

7.22.1.3 INT DATABASE_HEADER::first_free_data

7.22.1.4 INT DATABASE_HEADER::first_free_key

7.22.1.5 INT DATABASE_HEADER::key_size

7.22.1.6 INT DATABASE_HEADER::max_client_index

7.22.1.7   char DATABASE_HEADER::name[NAME_LENGTH]

7.22.1.8   INT DATABASE_HEADER::num_clients

7.22.1.9   INT DATABASE_HEADER::root_key

7.23 DEF_RECORD Struct Reference

7.23.1 Field Documentation

7.23.1.1 DWORD DEF_RECORD::def_offset

7.23.1.2 DWORD DEF_RECORD::event_id

7.23.1.3 char DEF_RECORD::event_name[NAME_LENGTH]

7.24   DEVICE_DRIVER Struct Reference

Data Fields

- name
- ∗ dd
- channels
- ∗ bd
- DWORD flags
- ∗ dd_info

7.24.1   Field Documentation

7.24.1.1   INT(∗ DEVICE_DRIVER::bd)(INT cmd, ...)

7.24.1.2   INT DEVICE_DRIVER::channels

7.24.1.3   INT(∗ DEVICE_DRIVER::dd)(INT cmd, ...)

7.24.1.4   void∗ DEVICE_DRIVER::dd_info

7.24.1.5   DWORD DEVICE_DRIVER::flags

7.24.1.6   char DEVICE_DRIVER::name[NAME_LENGTH]

7.25 eqpmnt Struct Reference

Data Fields

- name
- **EQUIPMENT_INFO info**
- ∗ **readout** ∗
- ∗ **cd** **PEQUIPMENT**
- **DEVICE_DRIVER** ∗ **driver**
- ∗ **event_descrip**
- ∗ **cd_info**
- **status**
- **DWORD last_called**
- **DWORD last_idle**
- **DWORD poll_count**
- **format**
- **buffer_handle**
- **hkey_variables**
- **DWORD serial_number**
- **DWORD subevent_number**
- **DWORD odb_out**
- **DWORD odb_in**
- **DWORD bytes_sent**
- **DWORD events_sent**

7.25.1 Field Documentation

7.25.1.1 HNDLE eqpmnt::buffer_handle

7.25.1.2 DWORD eqpmnt::bytes_sent

7.25.1.3 INT(∗ eqpmnt::cd)(INT cmd, PEQUIPMENT)

7.25.1.4 void∗ eqpmnt::cd_info

7.25.1.5 DEVICE_DRIVER∗ eqpmnt::driver

7.25.1.6 void∗ eqpmnt::event_descrip

7.25.1.7 DWORD eqpmnt::events_sent

7.25.1.8 INT eqpmnt::format

7.25.1.9 HNDLE eqpmnt::hkey_variables

7.25.1.10   EQUIPMENT_INFO eqpmnt::info

7.25.1.11   DWORD eqpmnt::last_called

7.25.1.12   DWORD eqpmnt::last_idle

7.25.1.13   char eqpmnt::name[NAME_LENGTH]

7.25.1.14   DWORD eqpmnt::odb_in

>

7.25.1.15   DWORD eqpmnt::odb_out

>

7.25.1.16   DWORD eqpmnt::poll_count

7.25.1.17   INT(∗ eqpmnt::readout)(char ∗, INT)

7.25.1.18   DWORD eqpmnt::serial_number

7.25.1.19   EQUIPMENT_STATS eqpmnt::stats

7.25.1.20   INT eqpmnt::status

7.25.1.21 DWORD eqpmnt::subevent_number

7.26   EQUIPMENT_INFO Struct Reference

Data Fields

- **WORD event_id**
- **WORD trigger_mask**
- **buffer**
- **eq_type**
- **source**
- **format**
- **enabled**
- **read_on**
- **period**
- **event_limit**
- **DWORD num_subevents**
- **history**
- **frontend_host**
- **frontend_name**
- **frontend_file_name**

7.26.1   Field Documentation

7.26.1.1   char EQUIPMENT_INFO::buffer[NAME_LENGTH]

7.26.1.2   BOOL EQUIPMENT_INFO::enabled

7.26.1.3   INT EQUIPMENT_INFO::eq_type

7.26.1.4   WORD EQUIPMENT_INFO::event_id

7.26.1.5   double EQUIPMENT_INFO::event_limit

7.26.1.6   char EQUIPMENT_INFO::format[8]

7.26.1.7   char EQUIPMENT_INFO::frontend_file_name[256]

7.26.1.8   char EQUIPMENT_INFO::frontend_host[NAME_-LENGTH]

7.26.1.9   char EQUIPMENT_INFO::frontend_name[NAME_-LENGTH]

7.26.1.10 INT EQUIPMENT_INFO::history

7.26.1.11 DWORD EQUIPMENT_INFO::num_subevents

7.26.1.12 INT EQUIPMENT_INFO::period

7.26.1.13 INT EQUIPMENT_INFO::read_on

7.26.1.14 INT EQUIPMENT_INFO::source

7.26.1.15 WORD EQUIPMENT_INFO::trigger_mask

7.27 EQUIPMENT_STATS Struct Reference

7.27.1 Field Documentation

7.27.1.1 double EQUIPMENT_STATS::events_per_sec

7.27.1.2 double EQUIPMENT_STATS::events_sent

7.27.1.3 double EQUIPMENT_STATS::kbytes_per_sec

7.28 EVENT_HEADER Struct Reference

7.28.1 Detailed Description

Data Fields

- event_id
- trigger_mask
- DWORD serial_number
- DWORD time_stamp
- DWORD data_size

7.28.2 Field Documentation

7.28.2.1 DWORD EVENT_HEADER::data_size

7.28.2.2 short int EVENT_HEADER::event_id

7.28.2.3 DWORD EVENT_HEADER::serial_number

7.28.2.4 DWORD EVENT_HEADER::time_stamp

7.28.2.5 short int EVENT_HEADER::trigger_mask

7.29 EVENT_REQUEST Struct Reference

7.29.1 Detailed Description

Data Fields

- id
- valid
- event_id
- trigger_mask
- sampling_type

7.29.2 Field Documentation

7.29.2.1 void(∗ EVENT_REQUEST::dispatch)(HNDLE, HNDLE, EVENT_HEADER ∗, void ∗)

7.29.2.2 short int EVENT_REQUEST::event_id

7.29.2.3 INT EVENT_REQUEST::id

7.29.2.4 INT EVENT_REQUEST::sampling_type

7.29.2.5   short int EVENT_REQUEST::trigger_mask

7.29.2.6   BOOL EVENT_REQUEST::valid

7.30 EXP_PARAM Struct Reference

7.30.1 Field Documentation

7.30.1.1 char EXP_PARAM::comment[80]

7.31 FREE_DESCRIP Struct Reference

Data Fields

- size
- next_free

7.31.1 Field Documentation

7.31.1.1 INT FREE_DESCRIP::next_free

7.31.1.2 INT FREE_DESCRIP::size

7.32 GLOBAL_PARAM Struct Reference

7.32.1 Field Documentation

7.32.1.1 float GLOBAL_PARAM::adc_threshold

7.33 HIST_RECORD Struct Reference

7.33.1 Field Documentation

7.33.1.1 DWORD HIST_RECORD::data_size

7.33.1.2 DWORD HIST_RECORD::def_offset

7.33.1.3 DWORD HIST_RECORD::event_id

7.33.1.4 DWORD HIST_RECORD::record_type

7.33.1.5 DWORD HIST_RECORD::time

7.34 HISTORY Struct Reference

7.34.1 Field Documentation

7.34.1.1 DWORD HISTORY::base_time

7.34.1.2 DWORD HISTORY::def_fh

7.34.1.3 DWORD HISTORY::def_offset

7.34.1.4 DWORD HISTORY::event_id

7.34.1.5 char HISTORY::event_name[NAME_LENGTH]

7.34.1.6 DWORD HISTORY::hist_fh

7.34.1.7 DWORD HISTORY::index_fh

7.34.1.8 DWORD HISTORY::n_tag

7.34.1.9 TAG∗ HISTORY::tag

7.35 INDEX_RECORD Struct Reference

7.35.1 Field Documentation

7.35.1.1 DWORD INDEX_RECORD::event_id

7.35.1.2 DWORD INDEX_RECORD::offset

7.35.1.3 DWORD INDEX_RECORD::time

7.36 KEY Struct Reference

Data Fields

- **DWORD type**
- **num_values**
- **name**
- **data**
- **total_size**
- **item_size**
- **WORD access_mode**
- **WORD notify_count**
- **next_key**
- **parent_keylist**
- **last_written**

7.36.1 Field Documentation

7.36.1.1 WORD KEY::access_mode

7.36.1.2 INT KEY::data

7.36.1.3 INT KEY::item_size

7.36.1.4   INT KEY::last_written

7.36.1.5   char KEY::name[NAME_LENGTH]

7.36.1.6   INT KEY::next_key

7.36.1.7   WORD KEY::notify_count

7.36.1.8   INT KEY::num_values

7.36.1.9   INT KEY::parent_keylist

7.36.1.10   INT KEY::total_size

7.36.1.11   DWORD KEY::type

7.37 KEYLIST Struct Reference

Data Fields

- **parent**
- **num_keys**
- **first_key**

7.37.1 Field Documentation

7.37.1.1 INT KEYLIST::first_key

7.37.1.2 INT KEYLIST::num_keys

7.37.1.3 INT KEYLIST::parent

7.38 OPEN_RECORD Struct Reference

Data Fields

- handle
- WORD access_mode
- WORD flags

7.38.1 Field Documentation

7.38.1.1 WORD OPEN_RECORD::access_mode

7.38.1.2 WORD OPEN_RECORD::flags

7.38.1.3 INT OPEN_RECORD::handle

7.39 PROGRAM_INFO Struct Reference

7.39.1 Detailed Description

7.39.2 Field Documentation

7.39.2.1 char PROGRAM_INFO::alarm_class[32]

7.39.2.2 BOOL PROGRAM_INFO::auto_restart

7.39.2.3 BOOL PROGRAM_INFO::auto_start

7.39.2.4 BOOL PROGRAM_INFO::auto_stop

7.39.2.5 DWORD PROGRAM_INFO::check_interval

7.39.2.6 DWORD PROGRAM_INFO::first_failed

7.39.2.7 BOOL PROGRAM_INFO::required

7.39.2.8   char PROGRAM_INFO::start_command[256]

7.39.2.9   INT PROGRAM_INFO::watchdog_timeout

7.40 RECORD_LIST Struct Reference

7.40.1 Field Documentation

7.40.1.1 WORD RECORD_LIST::access_mode

7.40.1.2 INT RECORD_LIST::buf_size

7.40.1.3 void* RECORD_LIST::copy

7.40.1.4 void* RECORD_LIST::data

7.40.1.5 void(* RECORD_LIST::dispatcher)(INT, INT, void *)

7.40.1.6 HNDLE RECORD_LIST::handle

7.40.1.7 HNDLE RECORD_LIST::hDB

7.40.1.8   void∗ RECORD_LIST::info

7.41   REQUEST_LIST Struct Reference

7.41.1   Field Documentation

7.41.1.1   INT REQUEST_LIST::buffer_handle

7.41.1.2   void(∗ REQUEST_LIST::dispatcher)(HNDLE, HNDLE, EVENT_HEADER ∗, void ∗)

7.41.1.3   short int REQUEST_LIST::event_id

7.41.1.4   short int REQUEST_LIST::trigger_mask

7.42   RUNINFO Struct Reference

7.42.1   Detailed Description

Data Fields

- state
- online_mode
- run_number
- transition_in_progress
- requested_transition
- start_time
- DWORD start_time_binary
- stop_time
- DWORD stop_time_binary

7.42.2   Field Documentation

7.42.2.1   INT RUNINFO::online_mode

7.42.2.2   INT RUNINFO::requested_transition

7.42.2.3   INT RUNINFO::run_number

7.42.2.4   char RUNINFO::start_time[32]

7.42.2.5   DWORD RUNINFO::start_time_binary

7.42.2.6   INT RUNINFO::state

7.42.2.7   char RUNINFO::stop_time[32]

7.42.2.8   DWORD RUNINFO::stop_time_binary

7.42.2.9   INT RUNINFO::transition_in_progress

7.43   SCALER_COMMON Struct Reference

7.43.1   Field Documentation

7.43.1.1   char SCALER_COMMON::buffer[32]

7.43.1.2   BOOL SCALER_COMMON::enabled

7.43.1.3   WORD SCALER_COMMON::event_id

7.43.1.4   double SCALER_COMMON::event_limit

7.43.1.5   char SCALER_COMMON::format[8]

7.43.1.6   char SCALER_COMMON::frontend_file_name[256]

7.43.1.7   char SCALER_COMMON::frontend_host[32]

7.43.1.8   char SCALER_COMMON::frontend_name[32]

7.43.1.9   INT SCALER_COMMON::log_history

7.43.1.10 DWORD SCALER_COMMON::num_subevents

7.43.1.11 INT SCALER_COMMON::period

7.43.1.12 INT SCALER_COMMON::read_on

7.43.1.13 INT SCALER_COMMON::source

7.43.1.14 WORD SCALER_COMMON::trigger_mask

7.43.1.15 INT SCALER_COMMON::type

7.44 TAG Struct Reference

Data Fields

- name
- **DWORD type**
- **DWORD n_data**

7.44.1 Field Documentation

7.44.1.1 DWORD TAG::n_data

-

7.44.1.2 char TAG::name[NAME_LENGTH]

-

7.44.1.3 DWORD TAG::type

-

7.45 TRIGGER_COMMON Struct Reference

7.45.1 Field Documentation

7.45.1.1 char TRIGGER_COMMON::buffer[32]

7.45.1.2 BOOL TRIGGER_COMMON::enabled

7.45.1.3 WORD TRIGGER_COMMON::event_id

7.45.1.4 double TRIGGER_COMMON::event_limit

7.45.1.5 char TRIGGER_COMMON::format[8]

7.45.1.6 char TRIGGER_COMMON::frontend_file_name[256]

7.45.1.7 char TRIGGER_COMMON::frontend_host[32]

7.45.1.8 char TRIGGER_COMMON::frontend_name[32]

7.45.1.9 INT TRIGGER_COMMON::log_history

7.45.1.10   DWORD TRIGGER_COMMON::num_subevents

7.45.1.11   INT TRIGGER_COMMON::period

7.45.1.12   INT TRIGGER_COMMON::read_on

7.45.1.13   INT TRIGGER_COMMON::source

7.45.1.14   WORD TRIGGER_COMMON::trigger_mask

7.45.1.15   INT TRIGGER_COMMON::type

7.46 TRIGGER_SETTINGS Struct Reference

7.46.1 Field Documentation

7.46.1.1 BYTE TRIGGER_SETTINGS::io506

Chapter 8

Midas File Documentation

8.1 adccalib.c File Reference

8.1.1 Define Documentation

8.1.1.1 #define ADC_N_BINS 500

8.1.1.2 #define ADC_X_HIGH 4000

8.1.1.3 #define ADC_X_LOW 0

8.1.2 Function Documentation

8.1.2.1 INT adc_calib (EVENT_HEADER ∗, void ∗)

8.1.2.2 INT adc_calib_bor (INT *run_number*)

8.1.2.3 INT adc_calib_eor (INT *run_number*)

8.1.2.4 INT adc_calib_init (void)

8.1.2.5 ADC_CALIBRATION_PARAM_STR (adc_calibration_param_str)

8.1.3 Variable Documentation

8.1.3.1 ANA_MODULE adc_calib_module

Initial value:

```
{
  "ADC calibration",
  "Stefan Ritt",
  adc_calib,
  adc_calib_bor,
  adc_calib_eor,
  adc_calib_init,
  NULL,
  &adccalib_param,
  sizeof(adccalib_param),
  adc_calibration_param_str,
}
```

8.1.3.2 ADC_CALIBRATION_PARAM adccalib_param

8.1.3.3 EXP_PARAM exp_param

8.1.3.4 TH1F∗ gAdcHists[N_ADC] [static]

8.1.3.5 TDirectory∗ gManaHistsDir

8.1.3.6 RUNINFO runinfo

8.2 adcsum.c File Reference

8.2.1 Define Documentation

8.2.1.1 #define PI 3.14159265359

8.2.2 Function Documentation

8.2.2.1 INT adc_summing (EVENT_HEADER *, void *)

8.2.2.2 INT adc_summing_bor (INT *run_number*)

8.2.2.3 INT adc_summing_init (void)

8.2.2.4 ADC_SUMMING_PARAM_STR (adc_summing_param_str)

8.2.3 Variable Documentation

8.2.3.1 ANA_MODULE adc_summing_module

Initial value:

```
{
  "ADC summing",
  "Stefan Ritt",
  adc_summing,
  NULL,
  NULL,
  adc_summing_init,
  NULL,
  &adc_summing_param,
  sizeof(adc_summing_param),
  adc_summing_param_str,
}
```

8.2.3.2 ADC_SUMMING_PARAM adc_summing_param

8.2.3.3 TH1F∗ gAdcSumHist [static]

8.2.3.4 TDirectory∗ gManaHistsDir

8.3 analyzer.c File Reference

8.3.1 Function Documentation

8.3.1.1 ADC0_BANK_STR (ana_adc0_bank_str)

8.3.1.2 INT ana_begin_of_run (INT *run_number*, char * *error*)

8.3.1.3 INT ana_end_of_run (INT *run_number*, char * *error*)

8.3.1.4 INT ana_pause_run (INT *run_number*, char * *error*)

8.3.1.5 INT ana_resume_run (INT *run_number*, char * *error*)

8.3.1.6 INT analyzer_exit ()

8.3.1.7 INT analyzer_init ()

8.3.1.8 INT analyzer_loop ()

8.3.1.9 ASUM_BANK_STR (asum_bank_str)

8.3.2 Variable Documentation

8.3.2.1 ANA_MODULE adc_calib_module

8.3.2.2   ANA_MODULE adc_summing_module

8.3.2.3   BANK_LIST ana_scaler_bank_list[]

Initial value:

```
{

  {"SCLR", TID_DWORD, N_ADC, NULL}
  ,

  {"ACUM", TID_DOUBLE, N_ADC, NULL}
  ,
  {""}
  ,
}
```

8.3.2.4   BANK_LIST ana_trigger_bank_list[]

Initial value:

```
{

  {"ADC0", TID_STRUCT, sizeof(ADC0_BANK), ana_adc0_bank_str}
  ,
  {"TDC0", TID_WORD, N_TDC, NULL}
  ,

  {"CADC", TID_FLOAT, N_ADC, NULL}
  ,
  {"ASUM", TID_STRUCT, sizeof(ASUM_BANK), asum_bank_str}
  ,
  {""}
  ,
}
```

8.3.2.5   ANALYZE_REQUEST analyze_request[]

8.3.2.6 INT analyzer_loop_period = 0

8.3.2.7 char∗ analyzer_name = "Analyzer"

8.3.2.8 EXP_PARAM exp_param

8.3.2.9 GLOBAL_PARAM global_param

8.3.2.10 INT odb_size = DEFAULT_ODB_SIZE

8.3.2.11 RUNINFO runinfo

8.3.2.12 ANA_MODULE scaler_accum_module

8.3.2.13 ANA_MODULE∗ scaler_module[]

Initial value:

```
{
  &scaler_accum_module,
```

```
    NULL
}
```

8.3.2.14 ANA_MODULE∗ trigger_module[]

Initial value:

```
 {
   &adc_calib_module,
   &adc_summing_module,
   NULL
}
```

8.3.2.15 TRIGGER_SETTINGS trigger_settings

8.4 analyzer.dox File Reference

8.5 appendixA.dox File Reference

8.6 appendixB.dox File Reference

8.7 appendixC.dox File Reference

8.8 appendixD.dox File Reference

8.9 appendixE.dox File Reference

8.10 appendixG.dox File Reference

8.11 components.dox File Reference

8.12   ebuser.c File Reference

8.12.1   Detailed Description

ebuser.c

Functions

- eb_begin_of_run   *   *
- eb_end_of_run   *
- eb_user   *ebch EVENT_-
  HEADER *   *   *

Variables

- lModulo

8.12.2   Function Documentation

8.12.2.1   INT eb_begin_of_run (INT *rn*, char * *UserField*, char * *error*)

Parameters:
> *rn*
>
> *UserField*
>
> *error*

Returns:

8.12.2.2   INT eb_end_of_run (INT *rn*, char * *error*)

Parameters:
> *rn*

error

Returns:

8.12.2.3   INT eb_user (INT *nfrag*, EBUILDER_CHANNEL ∗ *ebch*, EVENT_HEADER ∗ *pheader*, void ∗ *pevent*, INT ∗ *dest_size*)

EVENT_-
HEADER   ??

```
typedef struct {
    char   name[32];        // Fragment name (Buffer name).
    DWORD serial;           // Serial fragment number.
    char *pfragment;        // Pointer to fragment (EVENT_HEADER *)
    ...
} EBUILDER_CHANNEL;
```

TID_xxx   TID_
  xxx_BKTYPE   bank_name
        pdata
    ebuser.c   ??

It is not possible to mix within the same destination event different event format!

```
  // Event is empty, fill it with BANK_HEADER
  // If you need to add your own bank at this stage

  bk_init(pevent);
  bk_create(pevent, bank_name, TID_xxxx, &pdata);
  *pdata++ = ...;
  *dest_size = bk_close(pevent, pdata);
  pheader->data_size = *dest_size + sizeof(EVENT_HEADER);



  ybk_init(pevent);
  ybk_create(pevent, "EBBK", I4_BKTYPE, &pdata);
```

```
*pdata++ = 0x12345678;
*pdata++ = 0x87654321;
*dest_size = ybk_close(pevent, pdata);
*dest_size *= 4;
pheader->data_size = *dest_size + sizeof(YBOS_BANK_HEADER);
```

Parameters:

   nfrag

   ebch

   pheader

   pevent

   dest_size

Returns:

8.12.2.4   INT ebuser (INT, EBUILDER_CHANNEL ∗, EVENT_HEADER ∗, void ∗, INT ∗)

8.12.3   Variable Documentation

8.12.3.1   INT lModulo = 100

8.13 esone.c File Reference

8.13.1 Detailed Description

esone.c

Functions

- ccinit
- fccinit
- cdreg   *

- cssa   *   *
- cfsa   *   *
- cccc
- cccz
- ccci
- ctci   *
- cccd
- ctcd   *
- cdlam   *

- ctgl   *
- cclm
- cclnk   *
- cculk
- ccrgl
- cclc
- ctlm   *
- cfga
- csga
- cfmad
- csmad
- cfubc
- csubc
- cfubr
- csubr

8.13.2 Function Documentation

8.13.2.1 INLINE void cccc (const int *ext*)

cam_crate_clear() ??

Parameters:
>   *ext*

Returns:

8.13.2.2 INLINE void cccd (const int *ext*, int *l*)

Parameters:
>   *ext*
>
>   *l*   >   >

Returns:

8.13.2.3 INLINE void ccci (const int *ext*, int *l*)

Parameters:
>   *ext*
>
>   *l*   >   >

Returns:

8.13.2.4   INLINE void cccz (const int *ext*)

cam_crate_zinit()   ??

Parameters:
    ext

Returns:

8.13.2.5   INLINE void ccinit (void)

Returns:

8.13.2.6   INLINE void cclc (const int *lam*)

Parameters:
    lam

Returns:

8.13.2.7   INLINE void cclm (const int *lam*, int *l*)

Parameters:
    lam

    l   >   >

Returns:

8.13.2.8 INLINE void cclnk (const int *lam*, void(∗ *isr*)(void))

Parameters:
    lam
    isr

Returns:

8.13.2.9 INLINE void ccrgl (const int *lam*)

Parameters:
    lam

Returns:

8.13.2.10 INLINE void cculk (const int *lam*)

Parameters:
    lam

Returns:

8.13.2.11 INLINE void cdlam (int * *lam*, const int *b*, const int *c*, const int *n*, const int *a*, const int *inta*[2])

Parameters:
    lam

    b

    c

    n

    a

    inta

Returns:

8.13.2.12 INLINE void cdreg (int * *ext*, const int *b*, const int *c*, const int *n*, const int *a*)

        Supported hardware   **??**

Parameters:
    ext

    b

    c

    n

a

Returns:

8.13.2.13 INLINE void cfga (int *f*[ ], int *exta*[ ], int *intc*[ ], int *qa*[ ], int *cb*[ ])

Parameters:
   f
   exta[]
   intc[]
   qa[]
   cb[]

Returns:

8.13.2.14 INLINE void cfmad (int *f*, int *extb*[ ], int *intc*[ ], int *cb*[ ])

$<$

$>$

implementation of cb[2] for LAM recognition is not implemented.

Parameters:
   f

extb[]

intc[]

cb[]

Returns:

8.13.2.15 INLINE void cfsa (const int *f*, const int *ext*, unsigned long ∗ *d*, int ∗ *q*)

<   >

>   >

Parameters:

f

ext

d

q

Returns:

8.13.2.16 INLINE void cfubc (const int *f*, int *ext*, int *intc*[ ], int *cb*[ ])

Parameters:
   f

   ext

   intc[]

   cb[]

Returns:

8.13.2.17 INLINE void cfubr (const int *f*, int *ext*, int *intc*[ ], int *cb*[ ])

Parameters:
   f

   ext

   intc[]

   cb[]

Returns:

8.13.2.18 INLINE void csga (int *f*[ ], int *exta*[ ], int *intc*[ ], int *qa*[ ], int *cb*[ ])

Parameters:
   f

exta[]

intc[]

qa[]

cb[]

Returns:

8.13.2.19   INLINE void csmad (int *f*, int *extb*[ ], int *intc*[ ], int *cb*[ ])

$<$

$>$

implementation of cb[2] for LAM recognition is not implemented.

Parameters:

f

extb[]

intc[]

cb[]

Returns:

8.13.2.20 INLINE void cssa (const int *f*, int *ext*, unsigned short ∗ *d*, int ∗ *q*)

$<$ $>$

$>$ $>$

Parameters:

　f

　ext

　d

　q

Returns:

8.13.2.21 INLINE void csubc (const int *f*, int *ext*, int *intc*[ ], int *cb*[ ])

Parameters:

　f

　ext

　intc[]

　cb[]

Returns:

8.13.2.22 INLINE void csubr (const int *f*, int *ext*, int *intc*[ ], int *cb*[ ])

Parameters:
    f
    ext
    intc[]
    cb[]

Returns:

8.13.2.23 INLINE void ctcd (const int *ext*, int ∗ *l*)

Parameters:
    ext
    l   >   >

Returns:

8.13.2.24 INLINE void ctci (const int *ext*, int ∗ *l*)

cam_inhibit_test() ??

Parameters:
    ext

l > >

Returns:

8.13.2.25 INLINE void ctgl (const int *ext*, int ∗ *l*)

Parameters:
   ext
   l

Returns:

8.13.2.26 INLINE void ctlm (const int *lam*, int ∗ *l*)

Parameters:
   lam
   l > >

Returns:

8.13.2.27 INLINE int fccinit (void)

Returns:

8.14 eventbuilder.dox File Reference

8.15 experim.h File Reference

Data Structures

- ADC0_BANK
- ADC_CALIBRATION_PARAM
- ADC_SUMMING_PARAM
- ASUM_BANK
- EXP_PARAM
- GLOBAL_PARAM
- SCALER_COMMON
- TRIGGER_COMMON
- TRIGGER_SETTINGS

8.15.1 Define Documentation

8.15.1.1 #define ADC0_BANK_DEFINED

8.15.1.2 #define ADC0_BANK_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"adc0 = WORD : 0",\
"adc1 = WORD : 0",\
"adc2 = WORD : 0",\
"adc3 = WORD : 0",\
"",\
NULL }
```

8.15.1.3 #define ADC_CALIBRATION_PARAM_DEFINED

8.15.1.4 #define ADC_CALIBRATION_PARAM_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Pedestal = INT[8] :",\
"[0] 174",\
"[1] 194",\
"[2] 176",\
"[3] 182",\
"[4] 185",\
"[5] 215",\
"[6] 202",\
"[7] 202",\
"Software Gain = FLOAT[8] :",\
"[0] 1",\
"[1] 1",\
"[2] 1",\
"[3] 1",\
"[4] 1",\
"[5] 1",\
"[6] 1",\
"[7] 1",\
"Histo threshold = DOUBLE : 20",\
"",\
NULL }
```

8.15.1.5 #define ADC_SUMMING_PARAM_DEFINED

8.15.1.6 #define ADC_SUMMING_PARAM_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"ADC threshold = FLOAT : 5",\
"",\
NULL }
```

8.15.1.7 #define ASUM_BANK_DEFINED

8.15.1.8 #define ASUM_BANK_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Sum = FLOAT : 0",\
"Average = FLOAT : 0",\
"",\
NULL }
```

8.15.1.9   #define EXP_PARAM_DEFINED

8.15.1.10   #define EXP_PARAM_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Comment = STRING : [80] Test",\
"",\
NULL }
```

8.15.1.11   #define GLOBAL_PARAM_DEFINED

8.15.1.12   #define GLOBAL_PARAM_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"ADC Threshold = FLOAT : 5",\
"",\
NULL }
```

8.15.1.13 #define SCALER_COMMON_DEFINED

8.15.1.14 #define SCALER_COMMON_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Event ID = WORD : 2",\
"Trigger mask = WORD : 0",\
"Buffer = STRING : [32] SYSTEM",\
"Type = INT : 17",\
"Source = INT : 0",\
"Format = STRING : [8] MIDAS",\
"Enabled = BOOL : y",\
"Read on = INT : 377",\
"Period = INT : 10000",\
"Event limit = DOUBLE : 0",\
"Num subevents = DWORD : 0",\
"Log history = INT : 0",\
"Frontend host = STRING : [32] pc810",\
"Frontend name = STRING : [32] Sample Frontend",\
"Frontend file name = STRING : [256] C:\Midas\examples\experiment\frontend.c",\
"",\
NULL }
```

8.15.1.15 #define TRIGGER_COMMON_DEFINED

8.15.1.16 #define TRIGGER_COMMON_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"Event ID = WORD : 1",\
"Trigger mask = WORD : 0",\
"Buffer = STRING : [32] SYSTEM",\
"Type = INT : 2",\
"Source = INT : 16777215",\
"Format = STRING : [8] MIDAS",\
"Enabled = BOOL : y",\
"Read on = INT : 257",\
"Period = INT : 500",\
```

```
"Event limit = DOUBLE : 0",\
"Num subevents = DWORD : 0",\
"Log history = INT : 0",\
"Frontend host = STRING : [32] pc810",\
"Frontend name = STRING : [32] Sample Frontend",\
"Frontend file name = STRING : [256] C:\Midas\examples\experiment\frontend.c",\
"",\
NULL }
```

8.15.1.17   #define TRIGGER_SETTINGS_DEFINED

8.15.1.18   #define TRIGGER_SETTINGS_STR(_name)

Value:

```
char *_name[] = {\
"[.]",\
"IO506 = BYTE : 7",\
"",\
NULL }
```

8.16 frontend.c File Reference

8.16.1 Define Documentation

8.16.1.1 #define CRATE 0

8.16.1.2 #define N_ADC 4

8.16.1.3 #define N_SCLR 4

8.16.1.4 #define N_TDC 4

8.16.1.5 #define SLOT_ADC 1

8.16.1.6 #define SLOT_IO 23

8.16.1.7 #define SLOT_SCLR 3

8.16.1.8 #define SLOT_TDC 2

8.16.2 Function Documentation

8.16.2.1 ADC0_BANK_STR (adc0_bank_str)

8.16.2.2 INT begin_of_run (INT *run_number*, char ∗ *error*)

8.16.2.3 INT end_of_run (INT *run_number*, char ∗ *error*)

8.16.2.4 INT frontend_exit ()

8.16.2.5 INT frontend_init ()

8.16.2.6 INT frontend_loop ()

8.16.2.7 INT interrupt_configure (INT *cmd*, INT *source*, PTYPE *adr*)

8.16.2.8 INT pause_run (INT *run_number*, char ∗ *error*)

8.16.2.9 INT poll_event (INT *source*, INT *count*, BOOL *test*)

8.16.2.10 **INT read_scaler_event (char ∗ *pevent*, INT *off*)**

8.16.2.11 **INT read_trigger_event (char ∗ *pevent*, INT *off*)**

8.16.2.12 **INT resume_run (INT *run_number*, char ∗ *error*)**

8.16.3 Variable Documentation

8.16.3.1 **INT display_period = 3000**

8.16.3.2 **EQUIPMENT equipment[]**

8.16.3.3 **INT event_buffer_size = 10 ∗ 10000**

8.16.3.4 **BOOL frontend_call_loop = FALSE**

8.16.3.5 char∗ frontend_file_name = _ _FILE_ _

8.16.3.6 char∗ frontend_name = "Sample Frontend"

8.16.3.7 INT max_event_size = 10000

8.16.3.8 INT max_event_size_frag = 5 ∗ 1024 ∗ 1024

8.16.3.9 BANK_LIST scaler_bank_list[ ]

Initial value:

```
{
    {"SCLR", TID_DWORD, N_ADC, NULL}
    ,
    {""}
    ,
  }
```

8.16.3.10 BANK_LIST trigger_bank_list[ ]

Initial value:

```
{
    {"ADC0", TID_STRUCT, sizeof(ADC0_BANK), adc0_bank_str}
    ,
    {"TDC0", TID_WORD, N_TDC, NULL}
```

```
   ,
 {""}
   ,
}
```

8.17   internal.dox File Reference

8.18 introduction.dox File Reference

8.19 mcstd.h File Reference

8.19.1 Detailed Description

mcstd.h

Functions

- **cam16i**
  WORD ∗
- **cam24i**
  DWORD ∗
- **cam8i_q**
  ∗ ∗ ∗
- **cam16i_q**
  WORD ∗ ∗ ∗
- **cam24i_q**
  DWORD ∗ ∗ ∗
- **cam16i_r**
  WORD ∗∗
- **cam24i_r**
  DWORD ∗∗
- **cam8i_rq**
  ∗∗
- **cam16i_rq**
  WORD ∗∗
- **cam24i_rq**
  DWORD ∗∗
- **cam8i_sa**
  ∗∗
- **cam16i_sa**
  WORD ∗∗
- **cam24i_sa**
  DWORD ∗∗
- **cam8i_sn**
  ∗∗
- **cam16i_sn**
  WORD ∗∗
- **cam24i_sn**
  DWORD ∗∗
- **cami**
  WORD ∗

- cam8o

- cam16o
  WORD

- cam24o
  DWORD

- cam8o_q
  *	*

- cam16o_q
  WORD	*	*

- cam24o_q
  DWORD	*	*

- cam8o_r
  *

- cam16o_r
  WORD *

- cam24o_r
  DWORD *

- camo
  WORD

- camc_chk

- camc

- camc_q
  *

- camc_sa

- camc_sn

- cam_init

- cam_init_rpc	*host_name
  *exp_name	*	*	*

- cam_exit

- cam_inhibit_set

- cam_inhibit_clear

- cam_inhibit_test

- cam_crate_clear

- cam_crate_zinit

- cam_lam_enable

- cam_lam_disable

- cam_lam_read
  DWORD *

- cam_lam_clear

- cam_lam_wait ∗ DWORD
  ∗
- cam_interrupt_enable

- cam_interrupt_disable

- cam_interrupt_test
- cam_interrupt_attach
  ∗
- cam_interrupt_detach

8.20　mevb.c File Reference

Functions

- eb_begin_of_run　　　　*　　*
- eb_end_of_run　　　*
- eb_user　　　　　　　* EVENT_HEADER
  *　　*　　*
- source_scan
  *

Variables

- ebset

8.20.1　Function Documentation

8.20.1.1　INT eb_begin_of_run (INT *rn*, char * *UserField*, char * *error*)

Parameters:
   rn
   UserField
   error

Returns:

8.20.1.2　INT eb_end_of_run (INT *rn*, char * *error*)

Parameters:
   rn
   error

Returns:

8.20.1.3 INT eb_mfragment_add (char ∗ *pdest*, char ∗ *psrce*, INT ∗ *size*)

8.20.1.4 INT eb_user (INT *nfrag*, EBUILDER_CHANNEL ∗ *ebch*, EVENT_HEADER ∗ *pheader*, void ∗ *pevent*, INT ∗ *dest_size*)

EVENT_-
HEADER ??

```
typedef struct {
    char  name[32];          // Fragment name (Buffer name).
    DWORD serial;            // Serial fragment number.
    char *pfragment;         // Pointer to fragment (EVENT_HEADER *)
    ...
} EBUILDER_CHANNEL;
```

TID_xxx   TID_
  xxx_BKTYPE   bank_name
      pdata
    ebuser.c   ??

It is not possible to mix within the same destination event different event format!

```
// Event is empty, fill it with BANK_HEADER
// If you need to add your own bank at this stage

bk_init(pevent);
bk_create(pevent, bank_name, TID_xxxx, &pdata);
*pdata++ = ...;
*dest_size = bk_close(pevent, pdata);
pheader->data_size = *dest_size + sizeof(EVENT_HEADER);
```

```
ybk_init(pevent);
ybk_create(pevent, "EBBK", I4_BKTYPE, &pdata);
*pdata++ = 0x12345678;
```

```
*pdata++ = 0x87654321;
*dest_size = ybk_close(pevent, pdata);
*dest_size *= 4;
pheader->data_size = *dest_size + sizeof(YBOS_BANK_HEADER);
```

Parameters:

>*nfrag*

>*ebch*

>*pheader*

>*pevent*

>*dest_size*

Returns:

8.20.1.5 INT eb_yfragment_add (char ∗ *pdest*, char ∗ *psrce*, INT ∗ *size*)

8.20.1.6 void free_event_buffer (INT *nfrag*)

8.20.1.7 INT handFlush (INT)

8.20.1.8 int main (unsigned int *argc*, char ∗∗ *argv*)

8.20.1.9   INT source_booking (INT *nfrag*)

8.20.1.10   INT source_scan (INT *fmt*, INT *nfragment*, HNDLE *dest_hBuf*, char * *dest_event*)

Parameters:
    fmt

    nfragment

    dest_hBuf

    dest_event

Returns:

8.20.1.11   INT source_unbooking (nfrag)

8.20.1.12 INT tr_prestart (INT *rn*, char * *error*)

8.20.1.13 INT tr_stop (INT *rn*, char * *error*)

8.20.1.14 INT ybos_event_swap (DWORD * *pevt*)

8.20.2 Variable Documentation

8.20.2.1 BOOL abort_requested = FALSE stop_requested = TRUE

8.20.2.2 DWORD cdemask = 0

8.20.2.3 BOOL debug = FALSE debug1 = FALSE

8.20.2.4 EBUILDER_CHANNEL ebch[MAX_CHANNELS]

8.20.2.5 EBUILDER_SETTINGS ebset

****

8.20.2.6 EBUILDER_STATISTICS ebstat

8.20.2.7 DWORD gbl_bytes_sent = 0 gbl_events_sent = 0

8.20.2.8 INT gbl_run = 0

8.20.2.9 HNDLE hDB

8.20.2.10 HNDLE hKey

8.20.2.11 HNDLE hStatKey

8.20.2.12 DWORD max_event_size = MAX_EVENT_SIZE

8.20.2.13 INT(∗ meb_fragment_add)(char ∗, char ∗, INT ∗)

8.20.2.14 INT run_state = 0

8.20.2.15 DWORD start_time = 0 stop_time = 0 request_stop_time = 0

8.20.2.16 BOOL stopped = TRUE

8.20.2.17 BOOL wheel = FALSE

8.21 mfe.c File Reference

8.21.1 Define Documentation

8.21.1.1 #define DEFAULT_FE_TIMEOUT 60000

8.21.1.2 #define EQUIPMENT_COMMON_STR "\Event ID = WORD : 0\n\Trigger mask = WORD : 0\n\Buffer = STRING : [32] SYSTEM\n\Type = INT : 0\n\Source = INT : 0\n\Format = STRING : [8] FIXED\n\Enabled = BOOL : 0\n\Read on = INT : 0\n\Period = INT : 0\n\Event limit = DOUBLE : 0\n\Num subevents = DWORD : 0\n\Log history = INT : 0\n\Frontend host = STRING : [32] \n\Frontend name = STRING : [32] \n\Frontend file name = STRING : [256] \n\"

8.21.1.3 #define EQUIPMENT_STATISTICS_STR "\Events sent = DOUBLE : 0\n\Events per sec. = DOUBLE : 0\n\kBytes per sec. = DOUBLE : 0\n\"

8.21.1.4 #define ODB_UPDATE_TIME 1000

8.21.1.5 #define SERVER_CACHE_SIZE 100000

8.21.2 Function Documentation

8.21.2.1 INT begin_of_run (INT *run_number*, char * *error*)

8.21.2.2 void display (BOOL *bInit*)

8.21.2.3 INT end_of_run (INT *run_number*, char * *error*)

8.21.2.4 INT frontend_exit (void)

8.21.2.5 INT frontend_init (void)

8.21.2.6 INT frontend_loop (void)

8.21.2.7 INT interrupt_configure (INT *cmd*, INT *source*, PTYPE *adr*)

8.21.2.8 void interrupt_enable (BOOL *flag*)

8.21.2.9 void interrupt_routine (void)

8.21.2.10 BOOL logger_root ()

8.21.2.11 int main (int *argc*, char ∗ *argv*[ ])

8.21.2.12 INT manual_trigger (INT *index*, void ∗ *prpc_param*[ ])

8.21.2.13 int message_print (const char ∗ *msg*)

8.21.2.14 INT pause_run (INT *run_number*, char ∗ *error*)

8.21.2.15 INT poll_event (INT *source*, INT *count*, BOOL *test*)

8.21.2.16   INT register_equipment (void)

8.21.2.17   INT resume_run (INT *run_ number*, char $*$ *error*)

8.21.2.18   INT scheduler (void)

8.21.2.19   void send_all_periodic_events (INT *transition*)

8.21.2.20   int send_event (INT *index*)

8.21.2.21   INT tr_prepause (INT *rn*, char $*$ *error*)

8.21.2.22   INT tr_prestop (INT *rn*, char $*$ *error*)

8.21.2.23   INT tr_resume (INT *rn*, char $*$ *error*)

8.21.2.24 INT tr_start (INT *rn*, char * *error*)

8.21.2.25 void update_odb (EVENT_HEADER * *pevent*, HNDLE *hKey*, INT *format*)

8.21.3 Variable Documentation

8.21.3.1 DWORD actual_millitime

8.21.3.2 DWORD actual_time

8.21.3.3 DWORD auto_restart = 0

8.21.3.4 BOOL debug

8.21.3.5 INT display_period

8.21.3.6 EQUIPMENT equipment[]

8.21.3.7 INT event_buffer_size

8.21.3.8 char exp_name[NAME_LENGTH]

8.21.3.9 INT fe_stop = 0

8.21.3.10 BOOL frontend_call_loop

8.21.3.11 char∗ frontend_file_name

8.21.3.12   char∗ frontend_name

8.21.3.13   HNDLE hDB

8.21.3.14   char host_name[HOST_NAME_LENGTH]

8.21.3.15   BOOL interrupt_enabled

8.21.3.16 EQUIPMENT∗ interrupt_eq = NULL

8.21.3.17 EVENT_HEADER∗ interrupt_odb_buffer

8.21.3.18 BOOL interrupt_odb_buffer_valid

8.21.3.19 INT max_bytes_per_sec

8.21.3.20 INT max_event_size

8.21.3.21 INT max_event_size_frag

8.21.3.22 INT optimize = 0

8.21.3.23   INT run_number

8.21.3.24   INT run_state

8.22 mhttpd.dox File Reference

8.23 midas.c File Reference

8.23.1 Detailed Description

midas.c

Functions

- **cm_get_error** *
- **cm_set_msg_print**
  * *
- **cm_msg_log** *
- **cm_msg_log1** *
  *
- **cm_msg** *
  * *
- **cm_msg1** *
  * * *
- **cm_msg_register** * **EVENT_-HEADER** * *
- **cm_msg_retrieve** * *

- **cm_synchronize DWORD** *
- **cm_asctime** *
- **cm_time DWORD** *
- * **cm_get_version**
- **cm_set_path** *
- **cm_get_path** *
- **cm_scan_experiments**
- **cm_delete_client_info** **hDB**
- **cm_check_client** **hDB**
- **cm_set_client_info** **hDB** *
  *host_name * *
  DWORD
- **cm_get_client_info** *
- **cm_get_environment** *host_name
  *exp_name
- **cm_connect_experiment** *host_name *exp_-name * * *
- **cm_connect_experiment1** *host_name *exp_-name * * * odb_size
  DWORD

- cm_list_experiments   *host_name   exp_-name
- cm_select_experiment   *host_name   *exp_name
- cm_connect_client   *   *
- cm_disconnect_client
- cm_disconnect_experiment
- cm_set_experiment_database   hDB

- cm_get_experiment_database   *hDB   *

- cm_set_watchdog_params   DWORD

- cm_get_watchdog_params   *   DWORD *

- cm_get_watchdog_info   hDB   *
  DWORD *   DWORD *
- cm_register_transition   *
  *

- cm_register_deferred_transition
      *

- cm_check_deferred_transition
- cm_transition   run_number   *

- cm_yield
- cm_execute   *   *
- bm_match_event
  EVENT_HEADER *
- bm_open_buffer   *
  *

- bm_close_buffer
- bm_close_all_buffers
- cm_shutdown   *
- cm_exist   *
- cm_cleanup   *
- bm_set_cache_size

- bm_compose_event   EVENT_HEADER *
                              DWORD   DWORD

- bm_request_event
                                      *
      *   EVENT_HEADER *   *
- bm_remove_event_request

- **bm_delete_request**
- **bm_send_event** *

- **bm_flush_cache**
- **bm_receive_event** *
  *
- **bm_skip_event**
- **bm_push_event** *
- **bm_check_buffers**
- **bm_empty_buffers**
- **rpc_register_client** * *
- **rpc_register_functions** *
  * **
- **rpc_set_option**
- **rpc_send_event** *

- **rpc_flush_event**
- **bk_init** *
- **bk_init32** *
- **bk_size** *
- **bk_create** * * **WORD**
  *
- **bk_close** * *
- **bk_list** * *
- **bk_locate** * * *
- **bk_find** **BANK_HEADER** * *
  DWORD * **DWORD** * **
- **bk_iterate** * **BANK** ** *
- **bk_swap** *
- **hs_set_path** *
- **hs_open_file** **DWORD** * *
- **el_submit** * * *
  * * * * *
  * * *
  * * *

- **al_trigger_alarm** * *
  * *
- **dm_buffer_create**

Variables

- **_hKeyClient**

8.24　midas.dox File Reference

8.25 midas.h File Reference

8.25.1 Detailed Description

midas.h

Data Structures

- **ALARM**
- **ALARM_CLASS**
- **ANA_MODULE**
- **ANA_TEST**
- **ANALYZE_REQUEST**
- **AR_INFO**
- **AR_STATS**
- **BANK**
- **BANK32**
- **BANK_HEADER**
- **BANK_LIST**
- **BUFFER**
- **BUFFER_CLIENT**
- **BUFFER_HEADER**
- **BUS_DRIVER**
- **DEF_RECORD**
- **DEVICE_DRIVER**
- **eqpmnt**
- **EQUIPMENT_INFO**
- **EQUIPMENT_STATS**
- **EVENT_HEADER**
- **EVENT_REQUEST**
- **HIST_RECORD**
- **HISTORY**
- **INDEX_RECORD**
- **KEY**
- **KEYLIST**
- **PROGRAM_INFO**
- **RUNINFO**
- **TAG**

Defines

- TAPE_BUFFER_SIZE
- NET_TCP_SIZE
- OPT_TCP_SIZE
- NET_UDP_SIZE
- EVENT_BUFFER_SIZE
- EVENT_BUFFER_NAME
- MAX_EVENT_SIZE
- DEFAULT_EVENT_BUFFER_SIZE
- DEFAULT_ODB_SIZE
- NAME_LENGTH
- HOST_NAME_LENGTH
- MAX_CLIENTS
- MAX_EVENT_REQUESTS
- MAX_OPEN_RECORDS
- MAX_ODB_PATH
- MAX_EXPERIMENT
- BANKLIST_MAX
- STRING_BANKLIST_MAX   *
- STATE_STOPPED
- STATE_PAUSED
- STATE_RUNNING
- FORMAT_MIDAS
- FORMAT_YBOS
- FORMAT_ASCII
- FORMAT_FIXED
- FORMAT_DUMP
- FORMAT_HBOOK
- FORMAT_ROOT
- GET_ALL   <<
- GET_SOME   <<
- GET_FARM   <<
- TID_BYTE
- TID_SBYTE
- TID_CHAR
- TID_WORD
- TID_SHORT
- TID_DWORD
- TID_INT
- TID_BOOL
- TID_FLOAT
- TID_DOUBLE

- TID_BITFIELD
- TID_STRING
- TID_ARRAY
- TID_STRUCT
- TID_KEY
- TID_LINK
- TID_LAST
- SYNC
- MODE_READ <<
- RPC_OTIMEOUT
- WF_WATCH_ME <<
- TR_START <<
- TR_STOP <<
- TR_PAUSE <<
- TR_RESUME <<
- EQ_PERIODIC <<
- EQ_POLLED <<
- EQ_INTERRUPT <<
- EQ_SLOW <<
- EQ_MANUAL_TRIG <<
- EQ_FRAGMENTED <<
- RO_RUNNING <<
- RO_STOPPED <<
- RO_PAUSED <<
- RO_BOR <<
- RO_EOR <<
- RO_PAUSE <<
- RO_RESUME <<
- RO_TRANSITIONS | |
  |
- RO_ALWAYS
- RO_ODB <<
- CH_BS
- LAM_SOURCE << |
- LAM_STATION <<
- LAM_SOURCE_CRATE >>
- LAM_SOURCE_STATION
- CNAF
- max >
- min <
- ALIGN8 ~
- VALIGN ~
- MT_ERROR <<

- MT_INFO <<
- MT_DEBUG <<
- MT_USER <<
- MT_LOG <<
- MT_TALK <<
- MT_CALL <<
- MT_ALL
- MERROR
- MINFO
- MDEBUG
- MUSER
- MLOG
- MTALK
- MCALL
- SUCCESS
- CM_SUCCESS
- CM_SET_ERROR
- CM_NO_CLIENT
- CM_DB_ERROR
- CM_UNDEF_EXP
- CM_VERSION_MISMATCH
- CM_SHUTDOWN
- CM_WRONG_PASSWORD
- CM_UNDEF_ENVIRON
- CM_DEFERRED_TRANSITION
- CM_TRANSITION_IN_PROGRESS
- BM_SUCCESS
- BM_CREATED
- BM_NO_MEMORY
- BM_INVALID_NAME
- BM_INVALID_HANDLE
- BM_NO_SLOT
- BM_NO_MUTEX
- BM_NOT_FOUND
- BM_ASYNC_RETURN
- BM_TRUNCATED
- BM_MULTIPLE_HOSTS
- BM_MEMSIZE_MISMATCH
- BM_CONFLICT
- BM_EXIT
- BM_INVALID_PARAM
- BM_MORE_EVENTS
- BM_INVALID_MIXING

- BM_NO_SHM
- DB_SUCCESS
- DB_CREATED
- DB_NO_MEMORY
- DB_INVALID_NAME
- DB_INVALID_HANDLE
- DB_NO_SLOT
- DB_NO_MUTEX
- DB_MEMSIZE_MISMATCH
- DB_INVALID_PARAM
- DB_FULL
- DB_KEY_EXIST
- DB_NO_KEY
- DB_KEY_CREATED
- DB_TRUNCATED
- DB_TYPE_MISMATCH
- DB_NO_MORE_SUBKEYS
- DB_FILE_ERROR
- DB_NO_ACCESS
- DB_STRUCT_SIZE_MISMATCH
- DB_OPEN_RECORD
- DB_OUT_OF_RANGE
- DB_INVALID_LINK
- DB_CORRUPTED
- DB_STRUCT_MISMATCH
- SS_SUCCESS
- SS_CREATED
- SS_NO_MEMORY
- SS_INVALID_NAME
- SS_INVALID_HANDLE
- SS_INVALID_ADDRESS
- SS_FILE_ERROR
- SS_NO_MUTEX
- SS_NO_PROCESS
- SS_NO_THREAD
- SS_SOCKET_ERROR
- SS_TIMEOUT
- SS_SERVER_RECV
- SS_CLIENT_RECV
- SS_ABORT
- SS_EXIT
- SS_NO_TAPE
- SS_DEV_BUSY

- SS_IO_ERROR
- SS_TAPE_ERROR
- SS_NO_DRIVER
- SS_END_OF_TAPE
- SS_END_OF_FILE
- SS_FILE_EXISTS
- SS_NO_SPACE
- SS_INVALID_FORMAT
- SS_NO_ROOT
- RPC_SUCCESS
- RPC_ABORT
- RPC_NO_CONNECTION
- RPC_NET_ERROR
- RPC_TIMEOUT
- RPC_EXCEED_BUFFER
- RPC_NOT_REGISTERED
- RPC_CONNCLOSED
- RPC_INVALID_ID
- RPC_SHUTDOWN
- RPC_NO_MEMORY
- RPC_DOUBLE_DEFINED
- FE_SUCCESS
- FE_ERR_ODB
- FE_ERR_HW
- FE_ERR_DISABLED
- FE_ERR_DRIVER
- HS_SUCCESS
- HS_FILE_ERROR
- HS_NO_MEMORY
- HS_TRUNCATED
- HS_WRONG_INDEX
- HS_UNDEFINED_EVENT
- HS_UNDEFINED_VAR
- FTP_SUCCESS
- FTP_NET_ERROR
- FTP_FILE_ERROR
- FTP_RESPONSE_ERROR
- FTP_INVALID_ARG
- EL_SUCCESS
- EL_FILE_ERROR
- EL_NO_MESSAGE
- EL_TRUNCATED
- EL_FIRST_MSG

- EL_LAST_MSG
- AL_SUCCESS
- AL_INVALID_NAME
- AL_ERROR_ODB
- AL_RESET
- CMD_INIT $<<$
- CMD_WRITE
- CMD_INTERRUPT_ENABLE
- BD_GETS $\rightarrow$ $\rightarrow$

- ANA_CONTINUE
- TRIGGER_MASK EVENT_HEADER $*$ $\rightarrow$

- EVENT_ID EVENT_HEADER $*$ $\rightarrow$

- SERIAL_NUMBER EVENT_HEADER $*$ $\rightarrow$

- TIME_STAMP EVENT_HEADER $*$ $\rightarrow$

- EVENTID_BOR
- EVENTID_EOR
- EVENTID_MESSAGE
- EVENTID_FRAG1
- MIDAS_MAGIC
- DF_INPUT $<<$
- DF_OUTPUT $<<$
- DF_PRIO_DEVICE $<<$
- DF_READ_ONLY $<<$
- BANK_FORMAT_VERSION
- BANK_FORMAT_32BIT $<<$
- AT_INTERNAL
- AT_PROGRAM
- AT_EVALUATED
- AT_PERIODIC
- AT_LAST

8.26 mrpc.c File Reference

8.26.1 Detailed Description

mrpc.c

Variables

- **rpc_list_library**
- **rpc_list_system**

8.27 mrpc.h File Reference

8.27.1 Detailed Description

mrpc.h

Defines

- RPC_CM_SET_CLIENT_INFO
- RPC_CM_SET_WATCHDOG_PARAMS
- RPC_CM_CLEANUP
- RPC_CM_GET_WATCHDOG_INFO
- RPC_CM_MSG_LOG
- RPC_CM_EXECUTE
- RPC_CM_SYNCHRONIZE
- RPC_CM_ASCTIME
- RPC_CM_TIME
- RPC_CM_MSG
- RPC_CM_EXIST
- RPC_CM_MSG_RETRIEVE
- RPC_CM_MSG_LOG1
- RPC_BM_OPEN_BUFFER
- RPC_BM_CLOSE_BUFFER
- RPC_BM_CLOSE_ALL_BUFFERS
- RPC_BM_GET_BUFFER_INFO
- RPC_BM_GET_BUFFER_LEVEL
- RPC_BM_INIT_BUFFER_COUNTERS
- RPC_BM_SET_CACHE_SIZE
- RPC_BM_ADD_EVENT_REQUEST
- RPC_BM_REMOVE_EVENT_REQUEST
- RPC_BM_SEND_EVENT
- RPC_BM_FLUSH_CACHE
- RPC_BM_RECEIVE_EVENT
- RPC_BM_MARK_READ_WAITING
- RPC_BM_EMPTY_BUFFERS
- RPC_BM_SKIP_EVENT
- RPC_DB_OPEN_DATABASE
- RPC_DB_CLOSE_DATABASE
- RPC_DB_CLOSE_ALL_DATABASES
- RPC_DB_CREATE_KEY
- RPC_DB_CREATE_LINK

- RPC_DB_SET_VALUE
- RPC_DB_GET_VALUE
- RPC_DB_FIND_KEY
- RPC_DB_FIND_LINK
- RPC_DB_GET_PATH
- RPC_DB_DELETE_KEY
- RPC_DB_ENUM_KEY
- RPC_DB_GET_KEY
- RPC_DB_GET_DATA
- RPC_DB_SET_DATA
- RPC_DB_SET_DATA_INDEX
- RPC_DB_SET_MODE
- RPC_DB_GET_RECORD_SIZE
- RPC_DB_GET_RECORD
- RPC_DB_SET_RECORD
- RPC_DB_ADD_OPEN_RECORD
- RPC_DB_REMOVE_OPEN_RECORD
- RPC_DB_SAVE
- RPC_DB_LOAD
- RPC_DB_SET_CLIENT_NAME
- RPC_DB_RENAME_KEY
- RPC_DB_ENUM_LINK
- RPC_DB_REORDER_KEY
- RPC_DB_CREATE_RECORD
- RPC_DB_GET_DATA_INDEX
- RPC_DB_GET_KEY_TIME
- RPC_DB_GET_OPEN_RECORDS
- RPC_DB_FLUSH_DATABASE
- RPC_DB_SET_DATA_INDEX2
- RPC_DB_GET_KEY_INFO
- RPC_DB_GET_DATA1
- RPC_DB_SET_NUM_VALUES
- RPC_DB_CHECK_RECORD
- RPC_DB_GET_NEXT_LINK
- RPC_HS_SET_PATH
- RPC_HS_DEFINE_EVENT
- RPC_HS_WRITE_EVENT
- RPC_HS_COUNT_EVENTS
- RPC_HS_ENUM_EVENTS
- RPC_HS_COUNT_VARS
- RPC_HS_ENUM_VARS
- RPC_HS_READ
- RPC_HS_GET_VAR

- RPC_HS_GET_EVENT_ID
- RPC_EL_SUBMIT
- RPC_AL_CHECK
- RPC_AL_TRIGGER_ALARM
- RPC_RC_TRANSITION
- RPC_ANA_CLEAR_HISTOS
- RPC_LOG_REWIND
- RPC_TEST
- RPC_CNAF16
- RPC_CNAF24
- RPC_MANUAL_TRIG
- RPC_ID_WATCHDOG
- RPC_ID_SHUTDOWN
- RPC_ID_EXIT

8.28 msystem.h File Reference

8.28.1 Detailed Description

msystem.h

Data Structures

- **DATABASE**
- **DATABASE_CLIENT**
- **DATABASE_HEADER**
- **FREE_DESCRIP**
- **OPEN_RECORD**
- **RECORD_LIST**
- **REQUEST_LIST**

Defines

- **DRI_16** <<
- **DRI_32** <<
- **DRI_64** <<
- **DRI_LITTLE_ENDIAN** <<
- **DRI_BIG_ENDIAN** <<
- **DRF_IEEE** <<
- **DRF_G_FLOAT** <<
- **DR_ASCII** <<
- **WORD_SWAP**
- **DWORD_SWAP**
- **QWORD_SWAP**

8.29 mvmestd.h File Reference

8.29.1 Define Documentation

8.29.1.1 #define EXPRT

8.29.1.2 #define SUCCESS 1

8.29.1.3 #define VME_A16D16 1

8.29.1.4 #define VME_A16D32 2

8.29.1.5 #define VME_A24D16 3

8.29.1.6 #define VME_A24D32 4

8.29.1.7 #define VME_A32D16 5

8.29.1.8 #define VME_A32D32 6

8.29.1.9 #define VME_AMOD_A16 BT_AMOD_A16_SD

8.29.1.10 #define VME_AMOD_A16_ND (0x29)

8.29.1.11 #define VME_AMOD_A16_SD (0x2D)

8.29.1.12 #define VME_AMOD_A24 VME_AMOD_A24_SD

8.29.1.13 #define VME_AMOD_A24_D64 VME_AMOD_A24_SMBLT

8.29.1.14 #define VME_AMOD_A24_NB (0x3B)

8.29.1.15 #define VME_AMOD_A24_ND (0x39)

8.29.1.16 #define VME_AMOD_A24_NMBLT (0x38)

8.29.1.17 #define VME_AMOD_A24_NP (0x3A)

8.29.1.18 #define VME_AMOD_A24_SB (0x3F)

8.29.1.19 #define VME_AMOD_A24_SD (0x3D)

8.29.1.20 #define VME_AMOD_A24_SMBLT (0x3C)

8.29.1.21 #define VME_AMOD_A24_SP (0x3E)

8.29.1.22 #define VME_AMOD_A32 VME_AMOD_A32_SD

8.29.1.23 #define VME_AMOD_A32_D64 VME_AMOD_A32_SMBLT

8.29.1.24 #define VME_AMOD_A32_NB (0x0B)

8.29.1.25 #define VME_AMOD_A32_ND (0x09)

8.29.1.26 #define VME_AMOD_A32_NMBLT (0x08)

8.29.1.27 #define VME_AMOD_A32_NP (0x0A)

8.29.1.28 #define VME_AMOD_A32_SB (0x0F)

8.29.1.29 #define VME_AMOD_A32_SD (0x0D)

8.29.1.30 #define VME_AMOD_A32_SMBLT (0x0C)

8.29.1.31 #define VME_AMOD_A32_SP (0x0E)

8.29.1.32 #define VME_IOCTL_AMOD_GET 1

8.29.1.33 #define VME_IOCTL_AMOD_SET 0

8.29.1.34 #define VME_LM 9

8.29.1.35 #define VME_RAMD16 7

8.29.1.36 #define VME_RAND32 8

8.29.2 Typedef Documentation

8.29.2.1 typedef unsigned long int DWORD

8.29.2.2 typedef unsigned short int WORD

8.29.3 Function Documentation

8.29.3.1 int EXPRT vme_close (int *vh*)

8.29.3.2 int EXPRT vme_ioctl (int *vh*, int *req*, int ∗ *parm*)

8.29.3.3 int EXPRT vme_mmap (int *vh*, void ∗∗ *ptr*, int *vme_addr*, int *size*)

8.29.3.4 int EXPRT vme_open (int *device*, int *mode*)

8.29.3.5 int EXPRT vme_read (int *vh*, void ∗ *dst*, int *vme_addr*, int *size*, int *dma*)

8.29.3.6 int EXPRT vme_unmap (int *vh*, void ∗ *ptr*, int *size*)

8.29.3.7 int EXPRT vme_write (int *vh*, void ∗ *src*, int *vme_addr*, int *size*, int *dma*)

8.30 newdocfeatures.dox File Reference

8.31   odb.c File Reference

8.31.1   Detailed Description

odb.c

Functions

- **db_open_database**   *
    *hDB   *
- **db_close_database**   hDB
- **db_lock_database**   hDB
- **db_unlock_database**   hDB
- **db_protect_database**   hDB
- **db_create_key**   hDB   hKey   *
  DWORD
- **db_create_link**   hDB   hKey   *
  *
- **db_delete_key1**   hDB   hKey

- **db_delete_key**   hDB   hKey

- **db_find_key**   hDB   hKey   *
    *
- **db_set_value**   hDB   *
    *   **DWORD**
- **db_get_value**   hDB   *
    *   *   **DWORD**
- **db_enum_key**   hDB   hKey
    *
- **db_get_key**   hDB   hKey **KEY** *
- **db_get_key_time**   hDB   hKey **DWORD**
  *
- **db_get_key_info**   hDB   hKey   *
    *   *   *
- **db_get_data**   hDB   hKey   *
    *   **DWORD**
- **db_get_data_index**   hDB   hKey   *
    *   **DWORD**
- **db_set_data**   hDB   hKey   *
    DWORD

- db_set_data_index   hDB   hKey   *
  DWORD
- db_load   hDB   *

- db_copy   hDB   hKey   *
  *   *
- db_paste   hDB   *
- db_save   hDB   hKey   *

- db_save_struct   hDB   hKey   *
  *
- db_sprintf   *   *
  DWORD
- db_get_record_size   hDB   hKey
  *
- db_get_record   hDB   hKey   *
  *
- db_set_record   hDB   hKey   *

- db_create_record   hDB   hKey   *
  *
- db_check_record   hDB   hKey   *
  *
- db_open_record   hDB   hKey   *
  WORD   *   *
  *
- db_close_record   hDB   hKey
- db_close_all_records
- db_update_record   hDB   hKey
- db_send_changed_records

8.32 odbstruct.dox File Reference

8.33 quickstart.dox File Reference

8.34   scaler.c File Reference

8.34.1   Function Documentation

8.34.1.1   INT scaler_accum (EVENT_HEADER *, void *)

8.34.1.2   INT scaler_clear (INT *run_ number*)

8.34.1.3   INT scaler_eor (INT *run_ number*)

8.34.2   Variable Documentation

8.34.2.1   double scaler[32]

8.34.2.2   ANA_MODULE scaler_accum_module

Initial value:

```
{
   "Scaler accumulation",
   "Stefan Ritt",
   scaler_accum,
   scaler_clear,
   scaler_eor,
   NULL,
   NULL,
   NULL,
   0,
   NULL,
}
```

8.35   system.c File Reference

8.35.1   Detailed Description

system.c

Functions

- ss_thread_create * *
  *
- ss_thread_kill
- DWORD ss_millitime
- DWORD ss_time
- ss_sleep

8.36 utilities.dox File Reference

8.37 ybos.c File Reference

8.37.1 Detailed Description

ybos.c

Functions

- **ybk_init DWORD** ∗
- **ybk_create DWORD** ∗ ∗ **DWORD** ∗
- **ybk_close DWORD** ∗ ∗
- **ybk_size DWORD** ∗
- **ybk_list DWORD** ∗ ∗
- **ybk_find DWORD** ∗ ∗ **DWORD** ∗ **DWORD** ∗ ∗∗
- **ybk_locate DWORD** ∗ ∗ ∗
- **ybk_iterate DWORD** ∗ ∗∗ ∗∗

8.38 ybos.h File Reference

8.38.1 Detailed Description

ybos.h

Defines

- **YBOS_PHYREC_SIZE**
- **YBOS_BUFFER_SIZE** *   <<

- **YB_BANKLIST_MAX**
- **YB_STRING_BANKLIST_MAX**
  *
- **YB_SUCCESS**
- **YB_EVENT_NOT_SWAPPED**
- **YB_DONE**
- **YB_WRONG_BANK_TYPE**
- **YB_BANK_NOT_FOUND**
- **YB_SWAP_ERROR**
- **YB_NOMORE_SLOT**
- **YB_UNKNOWN_FORMAT**
- **H_BLOCK_SIZE**
- **H_BLOCK_NUM**
- **H_HEAD_LEN**
- **H_START**
- **D_RECORD**
- **D_HEADER**
- **D_EVTLEN**
- **YB_COMPLETE**
- **YB_INCOMPLETE**
- **YB_NO_RECOVER**
- **YB_NO_RUN**
- **YB_ADD_RUN**
- **DSP_RAW**
- **DSP_BANK**
- **DSP_UNK**
- **DSP_DEC**
- **DSP_HEX**
- **DSP_ASC**
- **SWAP_D2WORD**

- EVID_TRINAT
- YBOS_EVID_BANK
- MIDAS_EVID_BANK
- I2_BKTYPE
- A1_BKTYPE
- I4_BKTYPE
- F4_BKTYPE
- D8_BKTYPE
- I1_BKTYPE
- MAX_BKTYPE

Chapter 9

Midas Page Documentation

9.1 MIDAS Analyzer

-

-

  ROOT
  HBOOK

  - **examples/experiment**   **ROOT**
  - **examples/hbookexpt**   **HBOOK**
    PAW

-

  ex-perim.h   **??**

-
    - **experim.h   ??**
        - *

    - **analyzer.c   ??**
        - *
        - *
        - *
        - *

    - **adccalib.c   ??   adcsum.c   ??   scaler.c   ??**
        - *   **fron-**
          tend.c   ??
    - **Makefile**
        - *

                                                                                        camacnul.c

-
    - **ROOT**

```
INT adc_calib_init(void)
{
   char name[256];
   int i;

   /* book CADC histos */

   for (i = 0; i < N_ADC; i++) {
      char title[256];

      sprintf(name, "CADC%02d", i);
      sprintf(title, "ADC %d", i);

      gAdcHists[i] = (TH1F *) gManaHistsDir->GetList()->FindObject(name);

      if (gAdcHists[i] == NULL)
         gAdcHists[i] = new TH1F(name, title, ADC_N_BINS, ADC_X_LOW, ADC_X_HIGH);
```

```
      }

      return SUCCESS;
   }
```

– **HBOOK**

```
INT adc_calib_init(void)
{
   char name[256];
   int i;

   /* book CADC histos */
   for (i = 0; i < N_ADC; i++) {
      sprintf(name, "CADC%02d", i);
      HBOOK1(ADCCALIB_ID_BASE + i, name, ADC_N_BINS,
             (float) ADC_X_LOW, (float) ADC_X_HIGH, 0.f);
   }

   return SUCCESS;
}
```

•

   Makefile

– **ROOT**

   *   **$ROOTSYS**

   *

                                                              $<$ $>$

                                                              HAVE_-
      HBOOK   **??**

– **HBOOK**

   *

                                                              $<$ $>$

   *

                              HAVE_HBOOK   **??**

– **Analyzer Lite**

   *

   *

                                                              an-
      alyzer.c   **??**   **adccalib.c**   **??**   **adcsum.c**   **??**

*

MultiStage Concept ??

9.1.1 MultiStage Concept

adccalib.c ??

adcsum.c ??
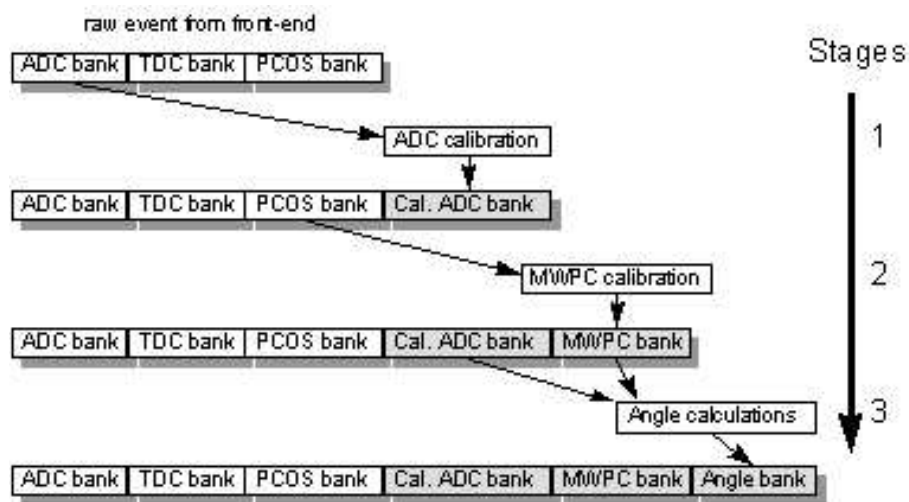
analyzer.c **??**

9.1.1.1 Analyzer parameters

analyzer.c **??**

```
/* The analyzer name (client name) as seen by other MIDAS clients   */
char *analyzer_name = "Analyzer";
```

```
[host:expt:S]/Analyzer>ls -l
Key name                      Type    #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
Parameters                    DIR
Output                        DIR
Book N-tuples                 BOOL    1     4     1m   0   RWD  y
Bank switches                 DIR
Module switches               DIR
ODB Load                      BOOL    1     4     19h  0   RWD  n
Trigger                       DIR
Scaler                        DIR
```

- **Parameters**

- **Output**

```
[local:midas:S]/Analyzer>ls -lr output
Key name                      Type    #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
Output                        DIR
    Filename                  STRING  1     256   47h  0   RWD  run01100.root
    RWNT                      BOOL    1     4     47h  0   RWD  n
    Histo Dump                BOOL    1     4     47h  0   RWD  n
    Histo Dump Filename       STRING  1     256   47h  0   RWD  his%05d.root
    Clear histos              BOOL    1     4     47h  0   RWD  y
```

```
              Last Histo Filename       STRING 1    256  47h 0   RWD  last.root
              Events to ODB             BOOL   1    4    47h 0   RWD  y
              Global Memory Name        STRING 1    8    47h 0   RWD  ONLN
```

– **Filename**

– **RWNT** **ROOT**

– **Histo Dump**

– **Histo Dump Filename**

– **Clear Histos**

– **Last Histo Filename**

– **Event to ODB**

– **Global Memory Name**

ROOT

- **Bank switches** **BANK_-**
  LIST **??** **analyzer.c** **??**

```
[local:midas:S]/Analyzer>ls "Bank switches" -l
Key name                    Type    #Val  Size  Last Opn Mode Value
---------------------------------------------------------------------
ADC0                        DWORD   1     4     1h   0   RWD  0
TDC0                        DWORD   1     4     1h   0   RWD  0
CADC                        DWORD   1     4     1h   0   RWD  0
ASUM                        DWORD   1     4     1h   0   RWD  0
SCLR                        DWORD   1     4     1h   0   RWD  0
ACUM                        DWORD   1     4     1h   0   RWD  0
```

- **Module switches** **ANA_-**
  MODULE **??** **analyzer.c** **??**

```
[local:midas:S]/Analyzer>ls "module switches" -l
Key name                    Type    #Val  Size  Last Opn Mode Value
---------------------------------------------------------------------
ADC calibration             BOOL    1     4     1h   0   RWD  y
ADC summing                 BOOL    1     4     1h   0   RWD  y
Scaler accumulation         BOOL    1     4     1h   0   RWD  y
```

- **ODB Load**

- **Trigger Scaler**
  ANALYZE_REQUEST ?? **analyzer.c** ??

- **BOOK N_tuples**

  HBOOK

- **BOOK TTree**

  ROOT

9.1.1.2 Analyzer Module parameters

$<\qquad>$

make **ex-**
perim.h ??

$<\qquad>$

- **ANA_MODULE** ??
  analyzer.c ??

- **adccalib.c** ??

- **adccalib.c** ??

```
ANA_MODULE adc_calib_module = {
    "ADC calibration",        /* module name        */
    "Stefan Ritt",            /* author             */
    adc_calib,                /* event routine      */
    adc_calib_bor,            /* BOR routine        */
    adc_calib_eor,            /* EOR routine        */
    adc_calib_init,           /* init routine       */
    NULL,                     /* exit routine       */
    &adccalib_param,          /* parameter structure */
    sizeof(adccalib_param),   /* structure size     */
    adc_calibration_param_str, /* initial parameters */
};
```

— $<\qquad>\qquad>$

— $<\qquad>$

—

```
          /* subtract pedestal */
        for (i = 0; i < N_ADC; i++)
           cadc[i] = (float) ((double) pdata[i] - adccalib_param.pedestal[i] + 0.5);
```

```
 [local:midas:S]Parameters>pwd
/Analyzer/Parameters
[local:midas:S]Parameters>ls -lr
Key name                      Type    #Val  Size  Last Opn Mode Value
------------------------------------------------------------------------
Parameters                    DIR
    ADC calibration           DIR
        Pedestal              INT     8     4     47h  0   RWD
                                      [0]               174
                                      [1]               194
                                      [2]               176
                                      [3]               182
                                      [4]               185
                                      [5]               215
                                      [6]               202
                                      [7]               202
        Software Gain         FLOAT   8     4     47h  0   RWD
                                      [0]               1
                                      [1]               1
                                      [2]               1
                                      [3]               1
                                      [4]               1
                                      [5]               1
                                      [6]               1
                                      [7]               1
        Histo threshold       DOUBLE  1     8     47h  0   RWD  20
    ADC summing               DIR
        ADC threshold         FLOAT   1     4     47h  0   RWD  5
    Global                    DIR
        ADC Threshold         FLOAT   1     4     47h  0   RWD  5
```

9.1.1.3 Analyzer Flow chart

-

  Utilities   ??

-

```
ANA_MODULE *trigger_module[] = {
    &adc_calib_module,
    &adc_summing_module,
    NULL
};
```

```
BANK_LIST ana_trigger_bank_list[] = {

  /* online banks */
  {"ADC0", TID_STRUCT, sizeof(ADC0_BANK), ana_adc0_bank_str}
  ,
  {"TDC0", TID_WORD, N_TDC, NULL}
  , ...




ANALYZE_REQUEST analyze_request[] = {
{"Trigger",                  /* equipment name */
 {1,                         /* event ID */
  TRIGGER_ALL,               /* trigger mask */
  GET_SOME,                  /* get some events */
  "SYSTEM",                  /* event buffer */
  TRUE,                      /* enabled */
  "", "",}
 ,
 NULL,                       /* analyzer routine */
 trigger_module,             /* module list */
 ana_trigger_bank_list,      /* bank list */
 1000,                       /* RWNT buffer size */
 TRUE,                       /* Use tests for this event */
 }
, ...
```

—

ana-
lyzer.c   **??**

—

```
INT analyzer_init()
{
  HNDLE hDB, hKey;
  char str[80];
```

```
RUNINFO_STR(runinfo_str);
EXP_PARAM_STR(exp_param_str);
GLOBAL_PARAM_STR(global_param_str);
TRIGGER_SETTINGS_STR(trigger_settings_str);

/* open ODB structures */
cm_get_experiment_database(&hDB, NULL);
db_create_record(hDB, 0, "/Runinfo", strcomb(runinfo_str));
db_find_key(hDB, 0, "/Runinfo", &hKey);
if (db_open_record(hDB, hKey, &runinfo, sizeof(runinfo), MODE_READ, NULL, NULL) !=
  DB_SUCCESS) {
 cm_msg(MERROR, "analyzer_init", "Cannot open \"/Runinfo\" tree in ODB");
 return 0;
}
```

```
[ladd00:p3a:Stopped]Module switches>ls
ADC calibration                      y
ADC summing                          y
Scaler accumulation                  y
[ladd00:p3a:Stopped]Module switches>
```

adccalib.c   ??

adc_calib()   ??

pheader   **pevent**

```
INT adc_calib(EVENT_HEADER * pheader, void *pevent)
{
 INT i;
 WORD *pdata;
 float *cadc;

 /* look for ADC0 bank, return if not present */
 if (!bk_locate(pevent, "ADC0", &pdata))
  return 1;
```

- **examples/experiment**
  ROOT   **examples/hbookexpt**   **HBOOK**

9.1.1.4   HBOOK analyzer description (old doc)

analyzer.c **??**

*

analyzer.c **??**

analyzer_-
init() **??**

analyzer.c **??**

ANA_MODULE **??**

```
...
// online banks
{ "ADC0", TID_DWORD, N_ADC, NULL },
{ "TDC0", TID_DWORD, N_TDC, NULL },

// calculated banks
{ "CADC", TID_FLOAT, N_ADC, NULL },
{ "ASUM", TID_STRUCT, sizeof(ASUM_BANK),
 asum_bank_str },,
```

< >

analyzer.c ??   ANALYZE_-
REQUEST   ??

<
>
< >
< >

analyzer_init() ??   analyzer_exit() ??
ana_begin_-
of_run() ??   ana_end_of_run() ??
ana_end_of_run() ??

```
[host:expt:S]ADC calibration>set Pedestal[9] 3
[host:expt:S]ADC calibration>set "Software Gain[9]" 3
[host:expt:S]ADC calibration>create double "Upper threshold"
[host:expt:S]ADC calibration>set "Upper threshold" 400
[host:expt:S]ADC calibration>ls -lr
Key name                        Type    #Val  Size  Last Opn Mode Value
-----------------------------------------------------------------------
ADC calibration                 DIR
    Pedestal                    INT     10    4     2m   0   RWD
                                        [0]               174
                                        [1]               194
                                        [2]               176
                                        [3]               182
                                        [4]               185
                                        [5]               215
                                        [6]               202
                                        [7]               202
                                        [8]               0
                                        [9]               3
    Software Gain               FLOAT   10    4     2m   0   RWD
                                        [0]               1
                                        [1]               1
                                        [2]               1
                                        [3]               1
                                        [4]               1
```

```
                                      [5]              1
                                      [6]              1
                                      [7]              1
                                      [8]              0
                                      [9]              0
         Histo threshold          DOUBLE  1     8    53m  0   RWD  20
         Upper threshold          DOUBLE  1     4    3s   0   RWD  400
```

experim.h   ??

```
[host:expt:S]ADC calibration>make
"experim.h" has been written to /home/midas/online
```

```
---> adccalib.c
...
fill ADC histos if above threshold
for (i=0 ; i<n_adc ; i++)
if ((cadc[i] > (float) adccalib_param.histo_threshold)
 && (cadc[i] < (float) adccalib_param.upper_threshold))
    HF1(ADCCALIB_ID_BASE+i, cadc[i], 1.f);
```

analyzer.c   ??

```
// ODB structures
...
GLOBAL_PARAM     global_param;
...
```

```
---> analyzer.c
...
sprintf(str, "/%s/Parameters/Global", analyzer_name);
db_create_record(hDB, 0, str, strcomb(global_param_str));
db_find_key(hDB, 0, str, &hKey);
if (db_open_record(hDB, hKey, &global_param
    , sizeof(global_param), MODE_READ, NULL, NULL) != DB_SUCCESS) {
  cm_msg(MERROR, "analyzer_init", "Cannot open \"%s\" tree in ODB", str);
  return 0;
}
```

extern

```
---> adccalib.c
...
extern GLOBAL_PARAM  global_param;
...
```

9.1.1.5 Online usage with PAW

analyzer [-h <host name>]
[-e <exp name>]

    <   >   <   >

```
PAW > global_s onln
PAW > hist/list
    1  Trigger
    2  Scaler
 1000  CADC00
 1001  CADC01
 1002  CADC02
 1003  CADC03
 1004  CADC04
 1005  CADC05
 1006  CADC06
 1007  CADC07
 2000  ADC sum
```

adc_calib_bor() ??
    adccalib.c ??

```
PAW > nt/print 1
...
PAW > nt/plot 1.sum
PAW > nt/plot 1.sum cadc0>3000
```
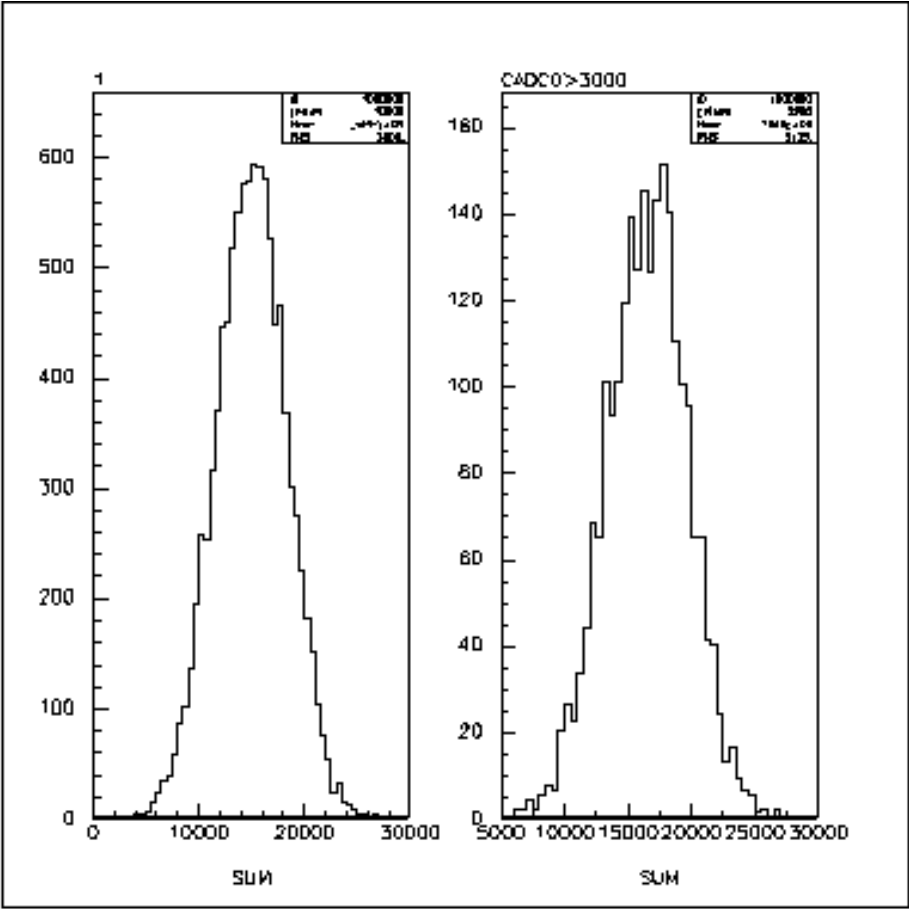
ANALYZE_REQUEST ??

analyzer.c ??

[local]/>hi analyzer <id>

< >

```
PAW >hi/file 1 run00001.rz 8190
PAW > ldir
```

9.1.1.6   Offline usage with PAW

*

-

-

-

-

-

-

-

```
[Analyzer/Parameters/ADC summing]
Offset = FLOAT : 123
```

-

-

-

-

9.2   Data format

Utilities   **??**   Top   **??**   Supported hardware   **??**

- **Midas format**   **??**

- **YBOS format**   **??**

9.2.1   Midas format

bm_compose_event()   **??**

EVENT_-
HEADER   **??**   midas.h   **??**

midas.h　**??**

bk_-

swap()　**??**
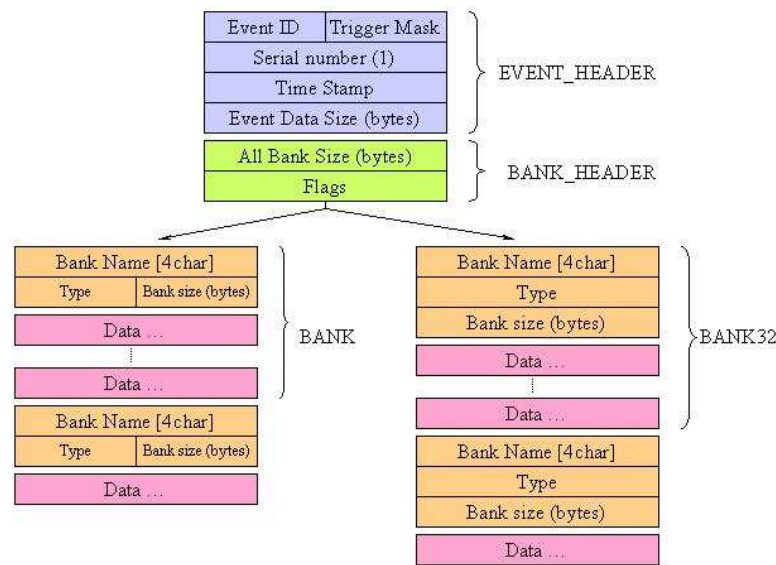
midas.h　**??**

9.2.2   YBOS format

```
Ybos site
```

-
-
-

-

-

-

-

-

-

YBOS Bank Types ??

ybos.h ??

LPR
Length of Physical Record
(exclusive, in I*4 units)

LPH
Length of Physical Header
(= 4)

Record number
(start with 0)

YBOS_PHYSREC_HEADER

Offset to 1st YBOS event
(= 4 for 1st event in PH)

Logical Record Length
(in I*4)

LRL

Data ...

YBOS Event

Data ...

Logical Record Length
(in I*4)

Data ...

Data ...

-

-

-

-

Utilities   ??   Top   ??   Supported hardware   ??

9.3 Supported hardware

Data format ?? Top ?? CAMAC and VME access function call ??

examples/slowcont/frontend
hv multi nulldev null

Slow Control System ??

Class	Device	Bus	Divers
generic.c	nulldev.c	null.c	caenv488.c
hv.c	epics_ca.c	vxVME.c	lrs1151.c
multi.c	lrs1454.c	camacrpc.c, camacnul.c	lrs1190.c
slowdev.c	dastemp.c	hytl331.c	lrs2365.c
	lrs1440.c	kcs2926.c kcs2927.c	lrs2373.c
	bb_psi.c	jorway73a.c	ps7106.c
	lrs4032.c	wecc32.c	sis3803.c
	lcwp950.c	camaclx.c	sis3700.c
	mscbdev.c	dsp004.c	vmeio.c
	lrs2415.c	ces8210.c	
	nitronic.c	rs232.c	
	caen170a.c	tcpip.c	
	das1600.c	cc7700pci.c	
		esone.c	
		ces2117.c	
		lrs1821.c	
		str340.c	
		bt617.c	

- **CAMAC drivers ??**
- **VME drivers ??**

- GPIB drivers ??

- Other drivers ??

9.3.1 CAMAC drivers

-

 –

Frequently Asked Questions ?? `Hytec`

 – [hyt1331.c Version >= 1.8.3]

dio task ??

 – [khyt1331.c Version >= 1.8.3]

 – [kcs292x.c]

`KCS`

camaclx.c

camac-kcs292x

`midas@triumf.ca`

 – [wecc32.c]

CC32
- **[dsp004.c]**

- **[ces8210.c]**

   mvmestd.h ?? mcstd.h ??

- **[jorway73a.c]**

   mcstd.h ??

-

   –

   –

   mcnaf task ?? mhttpd task ??

9.3.2 VME drivers

mvmestd.h ??

-

   –

      SIS

   –

                  Bit3
                  Wiener
   –
      PCI

-

- –
- –
- –
- –
- –
- –
- –
- –
- –
- –

9.3.3 GPIB drivers

National Instrument

midas@triumf.ca

The Linux Lab Project

9.3.4 Other drivers

- [Serial driver]

- [Network driver] tcpip.c/h

- [SCSI driver]

CAMAC drivers ??

Data format ?? **Top** ?? **CAMAC and VME access function call** ??

9.4   CAMAC and VME access function call

Supported hardware   ??   **Top**   ??   **Midas build options and op-eration considerations**   ??

independent

mcstd.h   ??

mvmestd.h   ??

mcstd

esone.c   ??

9.4.1   Midas CAMAC standard functions

mcstd.h   ??

9.4.2   ESONE CAMAC standard functions

Not all the functionality of ESONE standard have been fully tested

esone.c   ??

9.4.3   Midas VME standard functions

mvmestd.h   ??

9.4.4   Computer Busy Logic
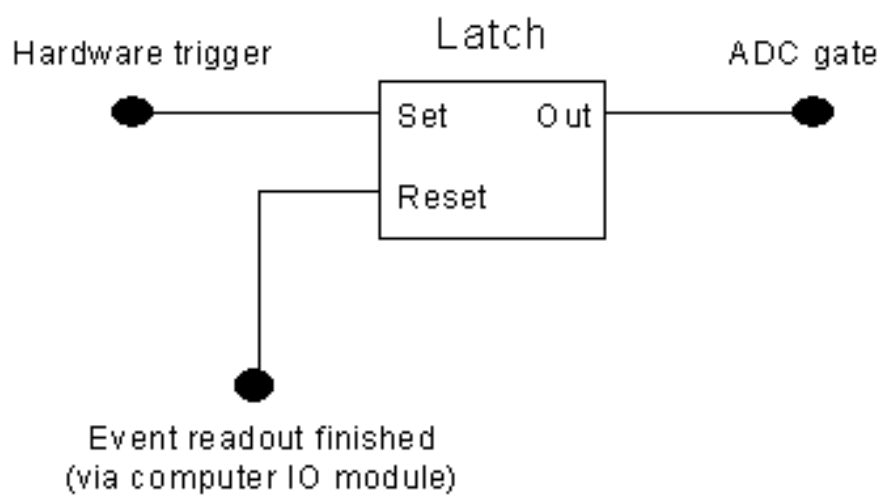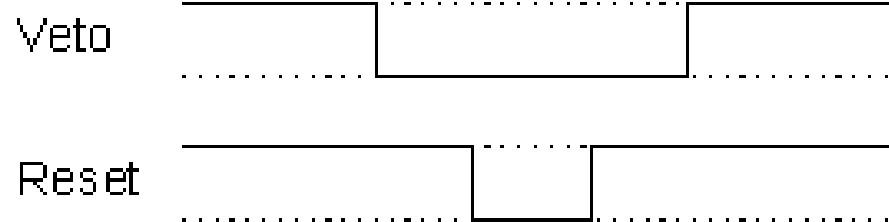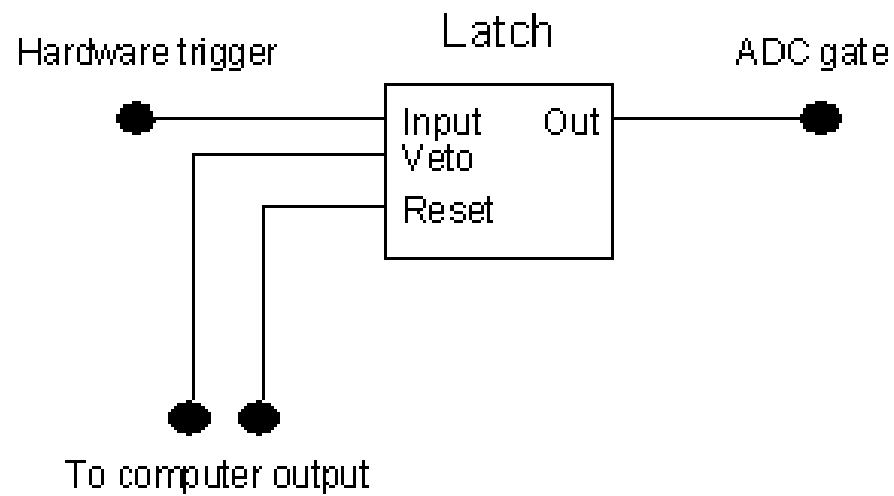
Supported hardware ?? **Top** ?? **Midas build options and operation considerations** ??

9.5　Midas build options and operation considerations

CAMAC and VME access function call　　**??**　　**Top**　　**??**　　**Midas Code and Libraries**　　**??**

Building Options　　**??**

Environment variables　　**??**

9.5.1　Building Options

-

  - **YBOS_VERSION_3_3**　　**??**
    INCLUDE_FTPLIB　**??**　　　**INCLUDE_ZLIB**　　**??**
    SPECIFIC_OS_PRG　　**??**

-

  - **HAVE_CAMAC**　　**??**　　**HAVE_ROOT**　　**??**　　**HAVE_-
    HBOOK**　　**??**　　**USE_EVENT_CHANNEL**　　**??**　　**DM_-
    DUAL_THREAD**　　**??**　　**USE_INT**　　**??**

-

  libmidas.so

  static

```
> make static
```

-

-

-

  USERFLAGS　　**??**

```
> rm linux/bin/mstat; make USERFLAGS=-static linux/bin/mstat
```

-

    – **OS_OSF1 OS_ULTRIX OS_FREEBSD OS_LINUX OS_SOLARIS**

- **OS_IRIX** **OS_VMS**

    ```
    OSFLAGS = -DOS_LINUX ...
    ```

-

    –

    –

9.5.2 USERFLAGS

```
make USERFLAGS=-static linux/bin/mstat
```

9.5.3 MIDAS_PREF_FLAGS

OSFLAGS

```
MIDAS_PREF_FLAGS = -DYBOS_VERSION_3_3 -DEVID_TWIST
```

9.5.4 HAVE_CAMAC

mcnaf task ?? **CNAF page ??**

9.5.5 HAVE_ROOT

analyzer task ?? **ROOT exam-**
ples/experiment/Makefile

ROOTSYS   **ROOTSYS**
                          ROOT
rmidas task   ??   **MIDAS Analyzer**   ??

9.5.6   HAVE_HBOOK

                    examples/hbookexpt/Makefile
analyzer task   ??   **HBOOK**   **PAW**

```
make CERNLIB_PACK=<your path>/libpacklib.a
```

-
                                        without HBOOK   **ROOT**
    MIDAS Analyzer   ??

9.5.7   SPECIFIC_OS_PRG

                                                                ms-
peaker, mlxspeaker tasks   ??   dio task   ??

```
SPECIFIC_OS_PRG = $(BIN_DIR)/mlxspeaker_task $(BIN_DIR)/dio_task
```

9.5.8   INCLUDE_FTPLIB

                                                        mlogger
task   ??   lazylogger task   ??

9.5.9   INCLUDE_ZLIB

                    lazylogger task   ??   **mdump task**   ??
       zlib.a
mid.gz   **ybs.gz**
                   mana.c

```
make USERFLAGS=-DINCLUDE_ZLIB linux/lib/ybos.o
make USERFLAGS=-static linux/bin/mdump
```

9.5.10   YBOS_VERSION_3_3

     YBOS_VERSION_3_3   **ybos.c**   **??**

```
make USERFLAGS=-DYBOS_VERSION_3_3 linux/lib/ybos.o
```

9.5.11   DM_DUAL_THREAD

  midas.c   **??**

9.5.12   USE_EVENT_CHANNEL

                    DM_DUAL_THREAD   **??**

9.5.13   USE_INT

  mfe.c   **??**

9.5.14   Environment variables

9.5.14.1   MIDAS_EXPTAB

                         exptab

          \\   \\

9.5.14.2   MIDAS_SERVER_HOST

9.5.14.3 MIDAS_EXPT_NAME

<
>

9.5.14.4 MIDAS_DIR

MIDAS_SERVER_HOST ?? MIDAS_EXPT_-
NAME ??

9.5.14.5 MCHART_DIR

CAMAC and VME access function call ?? Top ?? Midas Code
and Libraries ??

9.6 Midas Code and Libraries

Midas build options and operation considerations ?? **Top** ??
Frequently Asked Questions ??

- **State Codes & Transition Codes** ??
- **Midas Data Types** ??
    - **Midas bank examples** ??
- **YBOS Bank Types** ??
    - **YBOS bank examples** ??
- **Midas Code and Libraries** ??

9.6.1 State Codes & Transition Codes

- **ODB /RunInfo Tree** ??
    -
    -
    -

- **ODB /RunInfo Tree** ??
    -
    -
    -
    -

9.6.2 Midas Data Types

float *double*

-

-

-
-
-

Midas #define   ??

-
-
-
-
-
-   **
-   **   **
-
-
-

9.6.3   Midas bank examples

-
-

9.6.4   YBOS Bank Types

The Equipment structure   ??
YBOS #define   ??

- I1_BKTYPE

- **I2_BKTYPE**

- **I4_BKTYPE**

- **F4_BKTYPE**

- **D8_BKTYPE**

- **A1_BKTYPE**

9.6.5 YBOS bank examples

- **Frontend code**

```
-------- example 1 -------- Simple 16 bits bank construction

void read_cft (DWORD *pevent)
{
  DWORD *pbkdat, slot;

  ybk_create((DWORD *)pevent, "TDCP", I2_BKTYPE, &pbkdat);
  for (slot=FIRST_CFT;slot<=LAST_CFT;slot++)
    {
      cami(3,slot,1,6,(WORD *)pbkdat);
      ((WORD *)pbkdat)++;
      cam16i_rq(3,slot,0,4,(WORD **)&pbkdat,16);
    }
  ybk_close((DWORD *)pevent, I2_BKTYPE, pbkdat);
  return;
}
-------- example 2 -------- Simple 32bit bank construction
{
  DWORD *pbkdat;

  ybk_create((DWORD *)pevent, "TICS", I4_BKTYPE, &pbkdat);
  camo(2,22,0,17,ZERO);
  cam24i_r(2,22,0,0,(DWORD **) &pbkdat,10);
  cam24i_r(2,22,0,0,(DWORD **) &pbkdat,10);
  cam24i_r(2,22,0,0,(DWORD **) &pbkdat,10);
  cam24i_r(2,22,0,0,(DWORD **) &pbkdat,10);
  cam24i_r(2,22,0,0,(DWORD **) &pbkdat,9);
  ybk_close((DWORD *)pevent, I4_BKTYPE, pbkdat);
  return 0;
}
```

Midas Code and Libraries   ??

```
-------- example 3 -------- Full equipment readout function

INT read_cum_scaler_event(char *pevent, INT off)
{
  INT i;
  DWORD *pbkdat, *pbktop, *podbvar;

  ybk_init((DWORD *) pevent);

  // collect user hardware SCALER data
  ybk_create((DWORD *)pevent, "EVID", I4_BKTYPE, (DWORD *)(&pbkdat));
  *(pbkdat)++ = gbl_tgt_counter++;                          // event counter
  *((WORD *)pbkdat) = EVENT_ID(pevent);     ((WORD *)pbkdat)++;
  *((WORD *)pbkdat) = TRIGGER_MASK(pevent); ((WORD *)pbkdat)++;
  *(pbkdat)++ = SERIAL_NUMBER(pevent);
  *(pbkdat)++ = TIME_STAMP(pevent);
  *(pbkdat)++ = gbl_run_number;                             // run number
  ybk_close((DWORD *)pevent, pbkdat);

  // BEGIN OF CUMULATIVE SCALER EVENT
  ybk_create((DWORD *)pevent, "CUSC", I4_BKTYPE, (DWORD *)(&pbkdat));
  for (i=0 ; i<NSCALERS ; i++){
    *pbkdat++ = scaler[i].cuval[0];
    *pbkdat++ = scaler[i].cuval[1];
  }

  ybk_close(DWORD *)pevent, I4_BKTYPE, pbkdat);
  // END OF CUMULATIVE SCALER EVENT

  // event in bytes for Midas
  return (ybk_size ((DWORD *)pevent));
}
```

- **Backend code**
  ODB /Logger Tree   ??

```
--- Example of YBOS bank extraction ----

void process_event(HNDLE hBuf, HNDLE request_id, EVENT_HEADER *pheader, void *pevent)
{
    INT status;
    DWORD *plrl, *pybk, *pdata, bklen, bktyp;
    char  banklist[YB_STRING_BANKLIST_MAX];

    // pointer to data section
```

```
      plrl = (DWORD *)       pevent;

      // Swap event
      yb_any_event_swap(FORMAT_YBOS,plrl);

      // bank name given through argument list
      if ((status = ybk_find (plrl, sbank_name, &bklen, &bktyp, (void *)&pybk)) == YB_SUCCESS)
      {
        // given bank found in list
        status = ybk_list (plrl, banklist);
        printf("#banks:%i Bank list:-%s-\n",status,banklist);
        printf("Bank:%s - Length (I*4):%i - Type:%i - pBk:0x%p\n",sbank_name, bklen, bktyp, pybk);

        // check id EVID found in event for id and msk selection
        if ((status = ybk_find (plrl, "EVID", &bklen, &bktyp, (void *)&pybk)) == YB_SUCCESS)
        {
          pdata = (DWORD *)((YBOS_BANK_HEADER *)pybk + 1);
...
        }

       // iterate through the event
       pybk = NULL;
       while ((bklen = ybk_iterate(plrl, &pybk, (void *)&pdata))
                  && (pybk != NULL))
         printf("bank length in 4 bytes unit: %d\n",bklen);

      }
      else
      {
        status = ybk_list (plrl, banklist);
        printf("Bank -%s- not found (%i) in ",sbank_name, status);
        printf("#banks:%i Bank list:-%s-\n",status,banklist);
      }
      ...
      ... ...
}
```

9.6.6   Midas Code and Libraries

The midas.h & midas.c   ??

The msystem.h & system.c   ??

The mrpc.h & mrpc.c   ??

The odb.c   ??

The ybos.h & ybos.c   ??

- al_xxx

- bk_xxx

- bm_xxx

- cm_xxx

- db_xxx

- el_xxx

- hs_xxx

- ss_xxx

- ybk_xxx

9.6.7 MIDAS Macros

Midas Code and Libraries ?? Midas Macros ?? System Macros ?? YBOS Macros ??

- Message Macros cm_msg() ??

  cm_msg() ??

  - MERROR ??

  - MINFO ??

  - MDEBUG ??

  - MUSER ??

  - MLOG ??

  - MTALK ??

  - MCALL ??

- DAQ Event/LAM Macros

– **CAMAC LAM manipulation**

poll_event() **??**

– **LAM_SOURCE ??**
– **LAM_STATION ??**
– **LAM_SOURCE_CRATE ??**
– **LAM_SOURCE_STATION ??**

•

little-endian/big-endian

– **WORD_SWAP ??**
– **DWORD_SWAP ??**
– **QWORD_SWAP ??**

MIDAS Event Header manipulation

• **TRIGGER_MASK ??**

• **EVENT_ID ??**

• **SERIAL_NUMBER ??**

• **TIME_STAMP ??**

–

```
      INT adc_calib(EVENT_HEADER *pheader, void *pevent)
      {
        INT    i, n_adc;
        WORD   *pdata;
        float  *cadc;

        // look for ADC0 bank, return if not present
        n_adc = bk_locate(pevent, "ADC0", &pdata);
        if (n_adc == 0 || n_adc > N_ADC)
          return 1;

        // create calibrated ADC bank
        bk_create(pevent, "CADC", TID_FLOAT, &cadc);
        ...
      }
```

-

```
  INT read_trigger_event(char *pevent, INT off)
  {
    WORD *pdata, a;
    INT  q, timeout;

    // init bank structure
    bk_init(pevent);
    ...
  }
```

-

```
  INT read_ge_event(char *pevent, INT offset)
  {
    static WORD *pdata;
    INT i, x, q;
    WORD temp;

    // Change the time stamp in millisecond for the Super event
    TIME_STAMP(pevent) = ss_millitime();

    bk_init(pevent);
    bk_create(pevent, "GERM", TID_WORD, &pdata);
    ...
  }
```

-

```
  ...
  lam = *((DWORD *)pevent);

  if (lam & LAM_STATION(JW_N))
  {
    ...
    // compose event header
    TRIGGER_MASK(pevent) = JW_MASK;
    EVENT_ID(pevent)     = JW_ID;
```

```
        SERIAL_NUMBER(pevent)= eq->serial_number++;
        // read MCS event
        size = read_mcs_event(pevent);
        // Correct serial in case event is empty
        if (size == 0)
          SERIAL_NUMBER(pevent) = eq->serial_number--;
        ...
    }
    ...
```

9.6.7.1 YBOS library

<div align="center">ybos.h   ??</div>

**Midas build options and operation considerations   ??   Top   ??
Frequently Asked Questions   ??**

9.7 Frequently Asked Questions

Midas Code and Libraries ?? **Top** ?? **Data format** ??

Stefan Ritt Pierre-Andre
Amaudruz   Midas Forum

Why the CAMAC frontend generate a core dump (linux)?

-

dio task ?? mcnaf task ??

Where does Midas log file resides?

-

exptab

midas.log
mlogger task ??

How do I protected my experiment from being controlled by aliases?

-

webpass   Security
/Experiment   Web Password

ODB /Experiment Tree ??
- ODB /Experiment
Tree ??

Can I compose my own experimental web page?

-

mhttpd
task ?? Custom page ??

How do I prevent user to modify ODB values while the run is in progress?

- /Experiment/Lock

Read Only
ODB /Experiment Tree ??

Is there a way to invoke my own scripts from the web?

- /Script

ODB /Script Tree ??

I've seen the ODB prompt displaying the run state, how do you do that?

- /System/prompt

```
Fri> odb -e bnmr1 -h isdaq01
[host:expt:Stopped]/cd /System/
[host:expt:Stopped]/System>ls
Clients
Client Notify                    0
Prompt                           [%h:%e:%S]%p
Tmp
[host:expt:Stopped]/System
[host:expt:Stopped]/Systemset prompt [%h:%e:%S]%p>
[host:expt:Stopped]/System>ls
Clients
Client Notify                    0
Prompt                           [%h:%e:%S]%p>
Tmp
[host:expt:Stopped]/System>set Prompt [%h:%e:%s]%p>
[host:expt:S]/System>set Prompt [%h:%e:%S]%p>
[host:expt:Stopped]/System>
```

I've setup the alarm on one parameter in ODB but I can't make it trigger?

- ONLINE ODB /Run-Info Tree ?? Online Mode

How do I extend an array in ODB?

-

```
[local:midas:S]/>mkdir tmp
[local:midas:S]/>cd tmp
[local:midas:S]/tmp>create int number
[local:midas:S]/tmp>create string foo
String length [32]:
[local:midas:S]/tmp>ls -l
Key name                           Type    #Val  Size  Last Opn Mode Value
----------------------------------------------------------------------------
number                             INT     1     4     >99d 0   RWD  0
foo                                STRING  1     32    1s   0   RWD
[local:midas:S]/tmp>set number[4] 5
[local:midas:S]/tmp>set foo[3]
[local:midas:S]/tmp>ls -l
Key name                           Type    #Val  Size  Last Opn Mode Value
----------------------------------------------------------------------------
number                             INT     5     4     12s  0   RWD
                                   [0]                  0
                                   [1]                  0
                                   [2]                  0
                                   [3]                  0
                                   [4]                  5
foo                                STRING  4     32    2s   0   RWD
                                   [0]
                                   [1]
                                   [2]
                                   [3]
[local:midas:S]/tmp>set number[1..3] 9
[local:midas:S]/tmp>set foo[2] "A default string"
[local:midas:S]/tmp>ls -l
Key name                           Type    #Val  Size  Last Opn Mode Value
----------------------------------------------------------------------------
number                             INT     5     4     26s  0   RWD
                                   [0]                  0
                                   [1]                  9
                                   [2]                  9
                                   [3]                  9
                                   [4]                  5
foo                                STRING  4     32    3s   0   RWD
                                   [0]
                                   [1]
                                   [2]                  A default string
                                   [3]
```
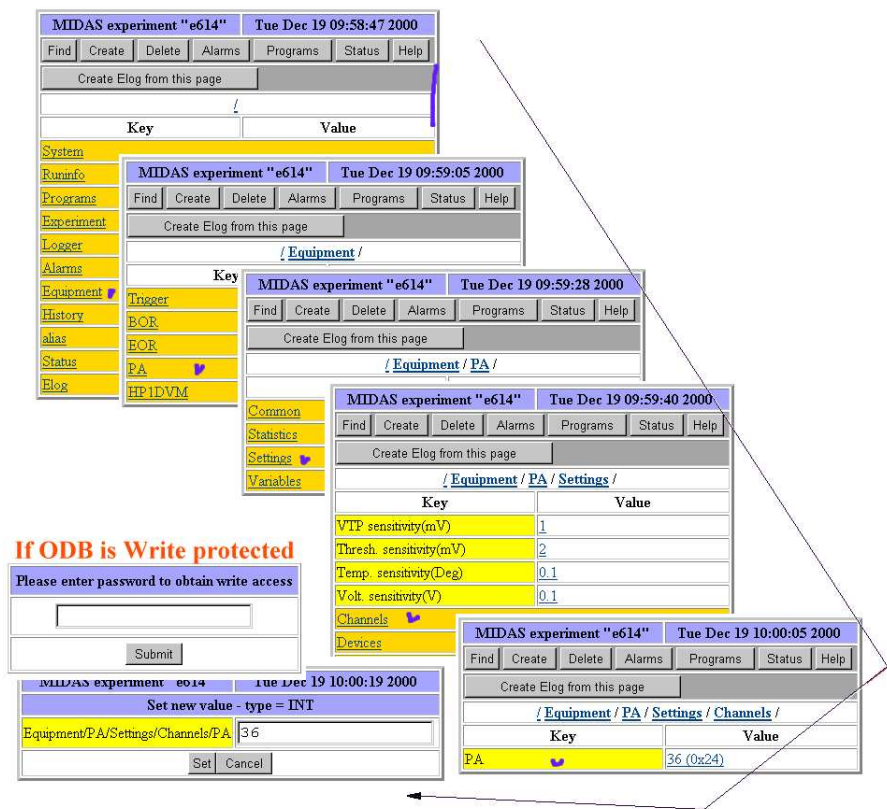
-

    Midas Code and Libraries ?? Top ?? Data format ??

9.8 Components

Quick Start ?? **Top** ?? **Internal features** ??

Buffer Manager ?? **Online Database** ??
Message System ?? **Run Control** ??

Online Database ??

`Midas Structure`
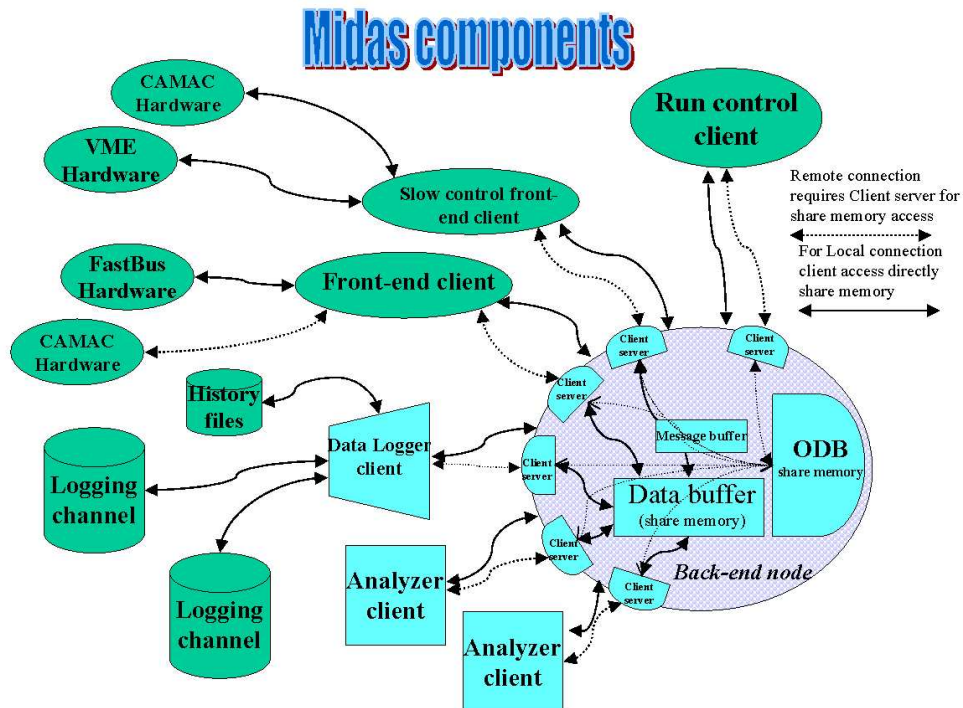
Midas

- **Buffer Manager** **??**
- **Message System** **??**
- **Online Database** **??**
- **Frontend** **??**
- **Midas Server** **??**
- **Data Logger** **??**
- **Analyzer** **??**
- **Run Control** **??**
- **Slow Control** **??**
- **History system** **??**

- **Alarm System** **??**

- **Electronic Logbook** **??**

9.8.1 Buffer Manager

9.8.2 Message System

9.8.3 Online Database

Hot Link **??**

ODB Structure **??**

9.8.4 Midas Server

9.8.5 Frontend

frontend

frontend
frontend

Equipment Equipment

- *Equipment(s)*
-
-
-
-

- *Periodic events*

- *Polled events*

  - *LAM events*
- *Interrupt events*

- *Slow Control events*

Frontend code **??**

9.8.6 Data Logger

MIDAS binary, YBOS binary, ASCII, ROOT and DUMP **Midas format ?? YBOS format ??**

-

    -

    -

    -

-

-

- **History system ??**

-

ODB /Logger Tree ??

9.8.7 Analyzer

Hot Link **??**

9.8.8 Run Control

Stopped Paused Running

Tr_Start Tr_pause Tr_resume Tr_Stop

Tr_Start Tr_Stop
Tr_preStart Tr_postStart Tr_preStop Tr_-
postStop
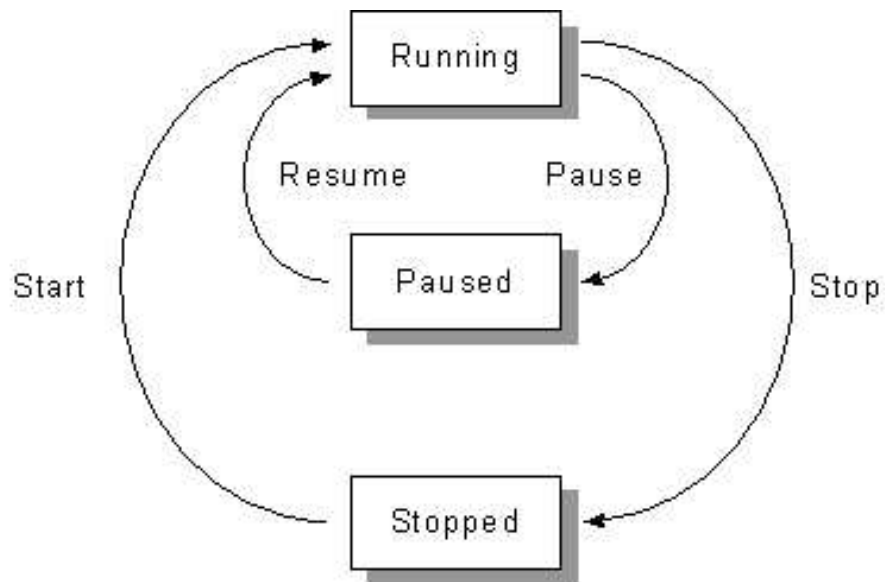
9.8.9 Slow Control

Hot Link ??

Supported hardware ??

Slow Control ??

9.8.10 History system

mlogger task ??

Frontend code ??

mhist task ??
mhttpd task ??

History system ?? ODB /History Tree ??

9.8.11 Alarm System

-
-
-

-
- Electronic Logbook ??

- Alarm System ?? ODB /Alarms Tree ??

9.8.12 Electronic Logbook

mhttpd task ??

Electronic Logbook ?? mhttpd task ??

Quick Start ?? Top ?? Internal features ??

9.9   Event Builder Functions

ODB /Equipment Tree   ??

```
EQUIPMENT equipment[] = {

  { "Trigger1",               // equipment name
    1, 0,                     // event ID, trigger mask
    "BUF1",                   // event buffer
    ...
```

eb_user()   ??

THERE IS NO RECOVERY PROCESS AVAILABLE YET!

9.9.1   ODB/EBuilder Tree

```
[local:midas:S]/>ls -lr EBuilder
Key name                     Type    #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
```

```
EBuilder                    DIR
   Settings                 DIR
      Event ID              WORD    1    2     35h  0   RWD  1
      Trigger mask          WORD    1    2     35h  0   RWD  1
      Buffer                STRING  1    32    35h  0   RWD  SYSTEM
      Format                STRING  1    32    35h  0   RWD  MIDAS
      User build            BOOL    1    4     35h  0   RWD  n
      User Field            STRING  1    64    3h   0   RWD  1024
   Event mask        DWORD   1    4     35h  0   RWD  3
      Hostname              STRING  1    64    43m  0   RWD  dasdevpc
   Statistics               DIR
      Events sent           DOUBLE  1    8     38m  0   RWD  1883
      Events per sec.       DOUBLE  1    8     38m  0   RWD  0
      kBytes per sec.       DOUBLE  1    8     38m  0   RWD  0
   Channels                 DIR
      Frag1                 DIR
         Settings           DIR
            Event ID        WORD    1    2     35h  0   RWD  1
            Trigger mask    WORD    1    2     35h  0   RWD  65535
            Buffer          STRING  1    32    35h  0   RWD  BUF1
            Format          STRING  1    32    35h  0   RWD  MIDAS
            Event mask      DWORD   1    4     35h  0   RWD  1
         Statistics         DIR
            Events sent     DOUBLE  1    8     38m  0   RWD  1883
            Events per sec. DOUBLE  1    8     38m  0   RWD  1881.12
            kBytes per sec. DOUBLE  1    8     38m  0   RWD  0
      Frag2                 DIR
         Settings           DIR
            Event ID        WORD    1    2     35h  0   RWD  2
            Trigger mask    WORD    1    2     35h  0   RWD  65535
            Buffer          STRING  1    32    35h  0   RWD  BUF2
            Format          STRING  1    32    35h  0   RWD  MIDAS
            Event mask      DWORD   1    4     35h  0   RWD  2
         Statistics         DIR
            Events sent     DOUBLE  1    8     38m  0   RWD  1884
            Events per sec. DOUBLE  1    8     38m  0   RWD  1882.12
            kBytes per sec. DOUBLE  1    8     38m  0   RWD  0
```

9.9.2   EB Operation

>

>   >

•

```
eb> make
cc  -g -I/usr/local/include -I../../drivers -DOS_LINUX -Dextname -c ebuser.c
cc  -g -I/usr/local/include -I../../drivers -DOS_LINUX -Dextname -o mevb mevb.c \
        ebuser.o /usr/local/lib/libmidas.a  -lm -lz -lutil -lnsl
cc  -g -I/usr/local/include -I../../drivers -DOS_LINUX -Dextname \
        -c ../../drivers/bus/camacnul.c
cc  -g -I/usr/local/include -I../../drivers -DOS_LINUX -Dextname -o fe1 \
        fe1.c camacnul.o /usr/local/lib/mfe.o /usr/local/lib/libmidas.a \
    -lm -lz -lutil -lnsl
```

```
cc  -g -I/usr/local/include -I../../drivers -DOS_LINUX -Dextname -o fe2 \
        fe2.c camacnul.o /usr/local/lib/mfe.o /usr/local/lib/libmidas.a \
  -lm -lz -lutil -lnsl
eb>
```

-

```
eb> pwd
/home/midas/midas-1.8.3/examples/eventbuilder
eb> setenv MIDAS_DIR /home/midas/midas-1.8.3/examples/eventbuilder
eb> odbedit
[local:Default:S]/>ls
System
Programs
Experiment
Logger
Runinfo
Alarms
[local:Default:S]/>q
eb>
```

```
xterm1: eb> fe1
xterm2: eb> fe2
xterm3: eb> mevb
xterm4: eb> odbedit

[local:Default:S]/>ls
System
Programs
Experiment
Logger
Runinfo
Alarms
Equipment
EBuilder                      <--- New tree
[local:Default:S]/>scl
Name                Host
Fe1                 dasdevpc   <--- Frontend fragment 1
Fe2                 dasdevpc   <--- Frontend fragment 2
EBuilder            dasdevpc   <--- Event builder
ODBEdit             dasdevpc
[local:Default:S]/>
[local:Default:S]/>start now
Starting run #2

12:12:11 [ODBEdit] Run #2 started
[local:Default:R]/>stop

12:12:13 [ODBEdit] Run #2 stopped
12:12:16 [EBuilder] Run 2 Stop on frag#0; events_sent 144; npulser 0
12:12:16 [EBuilder] Run 2 Stop on frag#1; events_sent 144; npulser 0
[local:Default:S]/>
```

-

```
Run 2
In eb_begin_of_run
 nfrag : 2
bm_empty_buffer:1
bm_empty_buffer:1
Event Serial1 Fragment#:1 Data size:56 Serial1 Fragment#:2 Data size:56 Serial1
Event Serial2 Fragment#:1 Data size:56 Serial2 Fragment#:2 Data size:56 Serial2
Event Serial3 Fragment#:1 Data size:56 Serial3 Fragment#:2 Data size:56 Serial3
Event Serial4 Fragment#:1 Data size:56 Serial4 Fragment#:2 Data size:56 Serial4
Event Serial5 Fragment#:1 Data size:56 Serial5 Fragment#:2 Data size:56 Serial5
...
Event Serial141 Fragment#:1 Data size:56 Serial141 Fragment#:2 Data size:56 Serial141
Event Serial142 Fragment#:1 Data size:56 Serial142 Fragment#:2 Data size:56 Serial142
Event Serial143 Fragment#:1 Data size:56 Serial143 Fragment#:2 Data size:56 Serial143
Event Serial144 Fragment#:1 Data size:56 Serial144 Fragment#:2 Data size:56 Serial144
In eb_end_of_run
Run 2 Stop on frag#0; events_sent 144; npulser 0
Time between request and actual stop: 3457 ms
In eb_end_of_run
Run 2 Stop on frag#1; events_sent 144; npulser 0
Time between request and actual stop: 3459 ms
```

-

```
eb> odb -e midas
[local:midas:S]/>scl
Name              Host
Fe1               mid001.triumf.ca      <-- Node 1
Fe2               mid002.triumf.ca      <-- Node 2
EBuilder          dasdevpc              <-- Node 3
ODBEdit           dasdevpc              <-- Node 3
[local:midas:S]/>

Thu> mevb -e midas
Program mevb/EBuilder version 2 started

 New Run 209
In eb_begin_of_run
 nfrag : 2
bm_empty_buffer:1
bm_empty_buffer:1
Event Serial1 Fragment#:1 Data size:56 Serial1 Fragment#:2 Data size:56 Serial1
Event Serial2 Fragment#:1 Data size:56 Serial2 Fragment#:2 Data size:56 Serial2
Event Serial3 Fragment#:1 Data size:56 Serial3 Fragment#:2 Data size:56 Serial3
Event Serial4 Fragment#:1 Data size:56 Serial4 Fragment#:2 Data size:56 Serial4
Event Serial5 Fragment#:1 Data size:56 Serial5 Fragment#:2 Data size:56 Serial5
...
Event Serial233 Fragment#:1 Data size:56 Serial233 Fragment#:2 Data size:56 Serial233
Event Serial234 Fragment#:1 Data size:56 Serial234 Fragment#:2 Data size:56 Serial234
Event Serial235 Fragment#:1 Data size:56 Serial235 Fragment#:2 Data size:56 Serial235
In eb_end_of_run
Run 209 Stop on frag#0; events_sent 235; npulser 0
Time between request and actual stop: 4488 ms
```

9.9.3 mevb Status/Bugs

−

mevb.c ??

ebuser.c ??

•

9.10   Internal features

Quick Start   ??   **Top**   ??   **Utilities**   ??

- **Frontend code**   ??
  - **The Equipment structure**   ??

    * **MIDAS event construction**   ??
    * **YBOS event construction**   ??
    * **FIXED event construction**   ??
  - **Deferred Transition**   ??
  - **Super Event**   ??
- **ODB Structure**   ??
- **Hot Link**   ??
- **Alarm System**   ??
- **Slow Control System**   ??
- **Electronic Logbook**   ??
- **Log file**   ??

9.10.1   Frontend code

mfe.c   ??   **frontend.c**   ??

- **[Global declaration]**

  - **frontend_name** ??

  - **frontend_call_loop** ?? frontend_-loop() ??

  - **display_period** ??

  - **max_event_size** ??

  - **event_buffer_size** ??

    ```
    // The frontend name (client name) as seen by other MIDAS clients
    char *frontend_name = "Sample Frontend";

    // The frontend file name, don't change it
    char *frontend_file_name = __FILE__;

    // frontend_loop is called periodically if this variable is TRUE
    BOOL frontend_call_loop = FALSE;

    //a frontend status page is displayed with this frequency in ms
    INT display_period = 3000;

    //maximum event size produced by this frontend
    INT max_event_size = 10000;

    //buffer size to hold events
    INT event_buffer_size = 10*10000;

    // Global user section
    // number of channels
    ```

```
#define N_ADC   8
#define N_TDC   8
#define N_SCLR 8

CAMAC crate and slots
#define CRATE       0
#define SLOT_C212 23
#define SLOT_ADC    1
#define SLOT_TDC    2
#define SLOT_SCLR   3
```

- **[Prototype functions]**

```
INT frontend_init();
INT frontend_exit();
INT begin_of_run(INT run_number, char *error);
INT end_of_run(INT run_number, char *error);
INT pause_run(INT run_number, char *error);
INT resume_run(INT run_number, char *error);
INT frontend_loop();

INT read_trigger_event(char *pevent, INT off);
INT read_scaler_event(char *pevent, INT off);
```

_

ro_mode ??
begin_of_run() ?? end_of_run() ??
pause_run() ?? resume_run() ?? prior

  * frontend_init() ??

  * begin_of_run() ??

  * pause_run() ??

  * resume_run() ??

  * end_of_run() ??

  * frontend_exit() ??

- **[Equipment definition]** The Equipment structure ??

```
                    #undef USE_INT
                    EQUIPMENT equipment[] = {

                      { "Trigger",                            // equipment name
                         1, 0,                                // event ID, trigger mask
                         "SYSTEM",                            // event buffer
                    #ifdef USE_INT
                         EQ_INTERRUPT,                        // equipment type
                    #else
                         EQ_POLLED,                           // equipment type
                    #endif
                         LAM_SOURCE(CRATE, LAM_STATION(SLOT_C212)),    // event source crate 0
                         "MIDAS",                             // format
                         TRUE,                                // enabled
                         RO_RUNNING |                         // read only when running
                         RO_ODB,                              // and update ODB
                         500,                                 // poll for 500ms
                         0,                                   // stop run after this event limit
                         0,                                   // number of sub events
                         0,                                   // don't log history
                         "", "", "",
                         read_trigger_event,                  // readout routine
                       ,
                      ...
```

frontend_init()   **??**

```
                    cam_init();                              // Init CAMAC access
                    cam_crate_clear(CRATE);                  // Clear Crate
                    cam_crate_zinit(CRATE);                  // Z crate
                    cam_inhibit_set(CRATE);                  // Set I crate
                    return SUCCESS;
```

begin_of_run()   **??**

cam_lam_enable(CRATE, SLOT_IO)

run_number
error

```
                    // clear units
                    camc(CRATE, SLOT_C212, 0, 9);
                    camc(CRATE, SLOT_2249A, 0, 9);
                    camc(CRATE, SLOT_SC2, 0, 9);
                    camc(CRATE, SLOT_SC3, 0, 9);
```

```
            camc(CRATE, SLOT_C212, 0, 26);              // Enable LAM generation

            cam_inhibit_clear(CRATE);                   // Remove I

            cam_lam_enable(CRATE, SLOT_C212);           // Declare Station to CC as LAM source

            // set and clear OR1320 pattern bits
            camo(CRATE, SLOT_OR1320, 0, 18, 0x0330);
            camo(CRATE, SLOT_OR1320, 0, 21, 0x0663);    // Open run gate, reset latch
            return SUCCESS;
```

poll_event()   **??**   **EQ_POLLED**

 poll_event

 The Equipment structure   ??

 source

```
        // Trigger event routines ---------------------------------------
        INT poll_event(INT source, INT count, BOOL test)
            // Polling routine for events. Returns TRUE if event
            // is available. If test equals TRUE, don't return. The test
            // flag is used to time the polling.
        {
          int   i;
          DWORD lam;

          for (i=0 ; i<count ; i++)
            {
              cam_lam_read(LAM_SOURCE_CRATE(source), &lam);
              if (lam & LAM_SOURCE_STATION(source)) // Any of the equipment LAM
          // *** or ***
              if (lam)                              // Any LAM (independent of the equipment)
                if (!test)
                 return lam;

          return 0;
```

 – **[Remark]**

```
          LAM_SOURCE(JW_C,  LAM_STATION(GE_N)
                          | LAM_STATION(JW_N)),
```

 pevent

```
   INT read_trigger_event(char *pevent, INT off)
```

```
{
  DWORD lam;

  lam = *((DWORD *)pevent);

  // check LAM versus MCS station
  // The clear is performed at the end of the readout function
  if (lam & LAM_STATION(JW_N))
  {
   ...
      ...
}
```

read_trigger_event()   **??**

FIXED event construc-
tion   ??   MIDAS event construction   ??   YBOS event con-
struction   ??

```
// Event readout --------------------------------------------------
INT read_trigger_event(char *pevent, INT off)
{
  WORD *pdata, a;

  // init bank structure
  bk_init(pevent);

  // create ADC bank
  bk_create(pevent, "ADC0", TID_WORD, &pdata);
  ...
}
```

run_-
number
error

end_of_run()   **??**

run_number
error

```
// set and clear OR1320 pattern bits or close run gate.
camo(CRATE, SLOT_OR1320, 0, 18, 0x0CC3);
camo(CRATE, SLOT_OR1320, 0, 21, 0x0990);
```

```
            camc(CRATE, SLOT_C212, 0, 26);          // Enable LAM generation
            cam_lam_disable(CRATE, SLOT_C212);       // disable LAM in crate controller
            cam_inhibit_set(CRATE);                  // set crate inhibit
```

frontend_exit() **??**

9.10.1.1   The Equipment structure

frontend.c   **??**

frontend.c   **??**

```
#undef USE_INT
EQUIPMENT equipment[] = {

  { "Trigger",             // equipment name
     1, 0,                 // event ID, trigger mask
     "SYSTEM",             // event buffer
#ifdef USE_INT
     EQ_INTERRUPT,         // equipment type #else
     EQ_POLLED,            // equipment type
#endif
     LAM_SOURCE(0,0xFFFFFF),// event source crate 0, all stations
     "MIDAS",              // format
     TRUE,                 // enabled
     RO_RUNNING |          // read only when running
     RO_ODB,               // and update ODB
     500,                  // poll for 500ms
     0,                    // stop run after this event limit
     0,                    // number of sub events
     0,                    // don't log history
     "", "", "",
     read_trigger_event,   // readout routine
   ,
  ...
```

- ["trigger","scaler"]

- [1, 0]

- ["SYSTEM"]
  mfe.c ??

  – [Remark]

- [EQ_xxx]

  EQ_POLLED ?? **EQ_-
  INTERRUPT** ?? **EQ_SLOW** ??

EQ_POLLED ??

poll_event() ??

```
EQUIPMENT equipment[] = {

  { "Trigger",            // equipment name    ...
    500,                  // poll for 500ms
  ...
```

EQ_INTERRUPT ??

interrupt_configure() ??

```
INT interrupt_configure(INT cmd, INT source [], PTYPE adr)
{
  switch(cmd)
    {
```

```
            case CMD_INTERRUPT_ENABLE:
               cam_interrupt_enable();
               break;
            case CMD_INTERRUPT_DISABLE:
               cam_interrupt_disable();
               break;
            case CMD_INTERRUPT_ATTACH:
               cam_interrupt_attach((void (*)())adr);
               break;
            case CMD_INTERRUPT_DETACH:
               cam_interrupt_detach();
               break;

         return CM_SUCCESS;
```

EQ_PERIODIC **??**

EQ_SLOW **??**

idle

EQ_MANUAL_TRIG **??**

EQ_FRAGMENTED **??**

max_-
event_size_frag   fron-
tend.c   ??   max_event_size   ??

drivers

*
*
*

*

URCE   ??

read_trigger_event()   ??

- ["MIDAS"]

MIDAS and YBOS or FIXED and YBOS data format can be mixed at the frontend level, but the data logger (mlogger) is not able to handle this format diversity on a event-by-event basis. In practice a given experiment should keep the data format identical throughout the equipment definition.

-

$<$ $>$

Super Event   ??

History system   ??

ad_trigger_event()   ??

$<$ $>$

pevent

Example

```
... in the equipment declaration
    ...
    LAM_SOURCE(JW_C,  LAM_STATION(GE_N) | LAM_STATION(JW_N)), // event source
    ...
    "", "", "",
    event_dispatcher,   // readout routine
...

INT event_dispatcher(char *pevent)
{
  DWORD lam, dword;
  INT    size=0;
  EQUIPMENT      *eq;

  // the *pevent contains the LAM pattern returned from poll_event
  //  The value can be used to dispatch to the proper LAM function

  // !!!! ONLY one of the LAM is processed in the loop !!!!
  lam = *((DWORD *)pevent);

  // check LAM versus MCS station
  if (lam & LAM_STATION(JW_N))
  {
```

```
          ...
          // read MCS event
          size = read_mcs_event(pevent);
          ...

        else if (lam & LAM_STATION(GE_N))
        {
          ...
          // read GE event
          size = read_ge_event(pevent);
          ...

        return size;
```

9.10.1.2 FIXED event construction

```
typedef struct {
  int adc0;
  int adc1;
  int tdc0;
  int tdc1;
  TRIGGER_EVENT;
char *trigger_event_str[] = {
"adc0 = INT : 0",
"adc1 = INT : 0",
"tdc0 = INT : 0",
"tdc1 = INT : 0",
  ASUM_BANK;
```

trigger_event_str

```
{
...
  read_trigger_event, // readout routine
  poll_trigger_event, // polling routine
  trigger_event_str,  // init string
 ,
```

$$< \quad >$$

```
INT read_trigger_event(char *pevent)
{
TRIGGER_EVENT *ptrg;

  ptrg = (TRIGGER_EVENT *) pevent;
  ptrg->adc0 = <...>;
  ptrg->adc1 = <...>;
  ptrg->tdc0 = <...>;
  ptrg->tdc1 = <...>;

  return sizeof(TRIGGER_EVENT);
```

9.10.2   MIDAS event construction

- **bk_init()**   ??   **bk_init32()**   ??

- **bk_create()**   ??

- **bk_close()**   ??   **bk_-create()**   ??

- bk_locate()   ??

- bk_iterate()   ??

- bk_list()   ??

- bk_size()   ??

< >


```
INT read_trigger_event(char *pevent)
{
INT *pdata;

  bk_init(pevent);

  bk_create(pevent, "ADC0", TID_INT, &pdata);
  *pdata++ = <ADC0>
  *pdata++ = <ADC1>
  bk_close(pevent, pdata);

  bk_create(pevent, "TDC0", TID_INT, &pdata);
  *pdata++ = <TDC0>
  *pdata++ = <TDC1>
  bk_close(pevent, pdata);

  return bk_size(pevent);
```



```
INT read_trigger_event(char *pevent)
{
WORD *pdata, a;

  // init bank structure
  bk_init(pevent);

  // create ADC bank
  bk_create(pevent, "ADC0", TID_WORD, &pdata);

  // read ADC bank
  for (a=0 ; a<8 ; a++)
    cami(1, 1, a, 0, pdata++);

  bk_close(pevent, pdata);

  // create TDC bank
  bk_create(pevent, "TDC0", TID_WORD, &pdata);
```

```
// read TDC bank
for (a=0 ; a<8 ; a++)
  cami(1, 2, a, 0, pdata++);

bk_close(pevent, pdata);

return bk_size(pevent);
```

9.10.3 YBOS event construction

YBOS

- **ybk_init()**   ??

- **ybk_create()**   ??

- **ybk_close()**   ??   **ybk_-**
  create()   ??

- **ybk_size()**   ??

```
INT read_trigger_event(char *pevent)
{
  DWORD i;
  DWORD *pbkdat;

  ybk_init((DWORD *) pevent);

  // collect user hardware data
  ybk_create((DWORD *)pevent, "ADC0", I4_BKTYPE, (DWORD *)(&pbkdat));
  for (i=0 ; i<8 ; i++)
    *pbkdat++ = i & 0xFFF;
  ybk_close((DWORD *)pevent, pbkdat);

  ybk_create((DWORD *)pevent, "TDC0", I2_BKTYPE, (DWORD *)(&pbkdat));
  for (i=0 ; i<8 ; i++)
    *((WORD *)pbkdat)++ = (WORD)(0x10+i) & 0xFFF;
```

```
ybk_close((DWORD *) pevent, pbkdat);

ybk_create((DWORD *)pevent, "SIMU", I2_BKTYPE, (DWORD *)(&pbkdat));
for (i=0 ; i<9 ; i++)
  *((WORD *)pbkdat)++ = (WORD) (0x20+i) & 0xFFF;
ybk_close((DWORD *) pevent, I2_BKTYPE, pbkdat);

return (ybk_size((DWORD *)pevent));
```

9.10.4   Deferred Transition

-

-

-

condition

-

```
//-- Frontend Init
INT frontend_init()
{
  INT    status, index, size;
  BOOL   found=FALSE;

  // register for deferred transition
  cm_register_deferred_transition(TR_STOP, wait_end_cycle);
  cm_register_deferred_transition(TR_PAUSE, wait_end_cycle);
  ...
```

-

```
//-- Deferred transition callback
BOOL wait_end_cycle(int transition, BOOL first)
{
  if (first)
  {
    transition_PS_requested = TRUE;
    return FALSE;
```

```
    if (end_of_mcs_cycle)
    {
      transition_PS_requested = FALSE;
      end_of_mcs_cycle = FALSE;
      return TRUE;

    else
      return FALSE;
```

-

```
... In this case at the end of the readout function...
  ...
INT read_mcs_event(char *pevent, INT offset)
{
  ...

  if (transition_PS_requested)
  {
    // Prevent to get new MCS by skipping re_arm_cycle and GE by GE_DISABLE LAM
    cam_lam_disable(JW_C,JW_N);
    cam_lam_disable(GE_C,GE_N);
    cam_lam_clear(JW_C,JW_N);
    cam_lam_clear(GE_C,GE_N);
    camc(GE_C,GE_N,0,GE_DISABLE);
    end_of_mcs_cycle = TRUE;

  re_arm_cycle();
  return bk_size(pevent);
```

wait_ end_ cycle

transition_ PS_ requested

/run-
info/Requested transition
State Codes & Transition Codes   ??

                                                              force

                          eg   >   >

9.10.5   Super Event

MIDAS   *YBOS*

                              bk_init()   **??**   **bk_-
init32()**   **??**   **ybk_init()**   **??**

    Super

                                      number

-   *Super*

```
{ "GE",                    // equipment name
    2, 0x0002,             // event ID, trigger mask
    "SYSTEM",              // event buffer
#ifdef USE_INT
    EQ_INTERRUPT,          // equipment type
#else
    EQ_POLLED,             // equipment type
#endif
    LAM_SOURCE(GE_C, LAM_STATION(GE_N)),      // event source
    "MIDAS",               // format
    TRUE,                  // enabled
    RO_RUNNING,            // read only when running
    200,                   // poll for 200ms
    0,                     // stop run after this event limit
    1000,                  // -----> number of sub event <-----  enable Super event
    0,                     // don't log history
    "", "", "",
    read_ge_event,         // readout routine
     ,
    ...
```

-

```
//-- Event readout
// Global and fixed -- Expect NWORDS 16bits data readout per sub-event
#define NWORDS 3

INT read_ge_event(char *pevent, INT offset)
{
  static WORD *pdata;

  // Super event structure
  if (offset == 0)
```

```
{
  // FIRST event of the Super event
  bk_init(pevent);
  bk_create(pevent, "GERM", TID_WORD, &pdata);

else if (offset == -1)
{
  // close the Super event if offset is -1
  bk_close(pevent, pdata);

  // End of Super Event
  return bk_size(pevent);


// read GE sub event (ADC)
cam16i(GE_C, GE_N, 0, GE_READ, pdata++);
cam16i(GE_C, GE_N, 1, GE_READ, pdata++);
cam16i(GE_C, GE_N, 2, GE_READ, pdata++);

// clear hardware
re_arm_ge();

if (offset == 0)
{
  // Compute the proper event length on the FIRST event in the Super Event
  // NWORDS correspond to the !! NWORDS WORD above !!
  // sizeof(BANK_HEADER) + sizeof(BANK) will make the 16 bytes header
  // sizeof(WORD) is defined by the TID_WORD in bk_create()

  return NWORDS * sizeof(WORD) + sizeof(BANK_HEADER) + sizeof(BANK);

else
  // Return the data section size only
  // sizeof(WORD) is defined by the TID_WORD in bk_create()

  return NWORDS * sizeof(WORD);
```

Super

Super
Endian

Super

9.10.6   Slow Control System

-

-

-

-

-

*
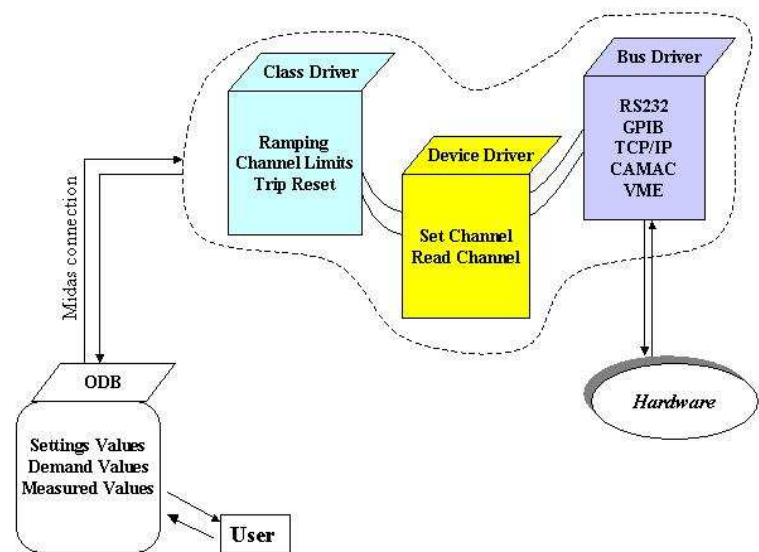
```
Key name                    Type   #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
Epics                       DIR
```

```
Settings                DIR
   Channels             DIR
      Epics             INT       1    4      25h  0    RWD   3
   Devices              DIR
      Epics             DIR
         Channel name   STRING   10   32      25h  0    RWD
                        [0]                        GPS:VAR1
                        [1]                        GPS:VAR2
                        [2]                        GPS:VAR3
      Names             STRING   10   32      17h  1    RWD
                        [0]                        Current
                        [1]                        Voltage
                        [2]                        Watchdog
      Update Threshold MeasureFLOAT  10    4   17h  0    RWD
                        [0]                        2
                        [1]                        2
                        [2]                        2
   Common               DIR
      Event ID          WORD      1    2      17h  0    RWD   3
      Trigger mask      WORD      1    2      17h  0    RWD   0
      Buffer            STRING    1   32      17h  0    RWD   SYSTEM
      Type              INT       1    4      17h  0    RWD   4
      Source            INT       1    4      17h  0    RWD   0
      Format            STRING    1    8      17h  0    RWD   FIXED
      Enabled           BOOL      1    4      17h  0    RWD   y
      Read on           INT       1    4      17h  0    RWD   121
      Period            INT       1    4      17h  0    RWD   60000
      Event limit       DOUBLE    1    8      17h  0    RWD   0
      Num subevents     DWORD     1    4      17h  0    RWD   0
      Log history       INT       1    4      17h  0    RWD   1
      Frontend host     STRING    1   32      17h  0    RWD   hostname
      Frontend name     STRING    1   32      17h  0    RWD   Epics
      Frontend file name STRING   1  256      17h  0    RWD   feepic.c
   Variables            DIR
      Demand            FLOAT    10    4      0s   1    RWD
                        [0]                        1.56
                        [1]                        120
                        [2]                        87
      Measured          FLOAT    10    4      2s   0    RWD
                        [0]                        1.56
                        [1]                        120
                        [2]                        87
   Statistics           DIR
      Events sent       DOUBLE    1    8      17h  0    RWDE  26
      Events per sec.   DOUBLE    1    8      17h  0    RWDE  0
      kBytes per sec.   DOUBLE    1    8      17h  0    RWDE  0
```

9.10.7 Electronic Logbook

mhttpd task   ??

Elog page   ??

ODB /Elog Tree   ??

9.10.8   Log file

midas.log

ODB /Logger Tree   ??   MIDAS_DIR   ??
                                      Environment variables   ??
                                          exptab   Experiment_Definition   ??

            midas.log   Data
        Dir

midas.log

        MIDAS Macros   ??


```
Fri Mar 24 10:48:40 2000 [CHAOS] Run 8362 started
Fri Mar 24 10:48:40 2000 [Logger] Run #8362 started
Fri Mar 24 10:55:04 2000 [Lazy_Tape] cni-043[10] (cp:383.6s) /dev/nst0/run08360.ybs 849.896MB file NEW
Fri Mar 24 11:24:03 2000 [MStatus] Program MStatus on host umelba started
Fri Mar 24 11:24:03 2000 [MStatus] Program MStatus on host umelba stopped
Fri Mar 24 11:27:02 2000 [Logger] stopping run after having received 1200000 events
Fri Mar 24 11:27:03 2000 [CHAOS] Run 8362 stopped
Fri Mar 24 11:27:03 2000 [SUSIYBOS] saving info in run log
Fri Mar 24 11:27:03 2000 [Logger] Run #8362 stopped
Fri Mar 24 11:27:13 2000 [Logger] starting new run
Fri Mar 24 11:27:14 2000 [CHAOS] Run 8363 started
Fri Mar 24 11:27:14 2000 [CHAOS] odb_access_file -I- /Equipment/kos_trigger/Dump not found
Fri Mar 24 11:27:14 2000 [Logger] Run #8363 started
Fri Mar 24 11:33:47 2000 [Lazy_Tape] cni-043[11] (cp:391.8s) /dev/nst0/run08361.ybs 850.209MB file NEW
Fri Mar 24 11:42:35 2000 [CHAOS] Run 8363 stopped
Fri Mar 24 11:42:40 2000 [SUSIYBOS] saving info in run log
Fri Mar 24 11:42:41 2000 [ODBEdit] Run #8363 stopped
Fri Mar 24 12:19:57 2000 [MChart] client [umelba.Triumf.CA]MChart failed watchdog test after 10 sec
Fri Mar 24 12:19:57 2000 [MChart] Program MChart on host koslx0 stopped
```


Quick Start   ??   Top   ??   Utilities   ??

9.11 Introduction

Top **??** **Top** **??** **New Documented Features** **??**

... A few words...

9.11.1 What is Midas?

MIDAS Analyzer **??**

Switzerland   Canada

9.11.2   What can MIDAS do for you?

Top   ??   Top   ??   New Documented Features   ??

9.12 mhttpd task

Utilities ?? **Top** ?? **Data format** ??
mhttpd

Config-

-
-
-
-
-
-
-
-
-
-

- **Start page** ??
- **ODB page** ??
- **Equipment page** ??
- **CNAF page** ??
- **Message page** ??
- **Elog page** ??

- **Program page**   ??

- **History page**   ??

- **Alarm page**   ??

- **Custom page**   ??

mhttpd

- **Arguments**

                                                Example

- **Usage**

    ```
    >mhttpd -p 8081 -D
    ```

-

            $<\qquad>$

                                                                **Start
  page**   ??

                                        ODB page   ??

                                        CNAF page   ??

                                        Message page   ??

                                        Elog page   ??

/Alarms

Alarm System   ??

Program page   ??

/History   History system   ??

History page   ??

Script

<

>

– **Arguments**
– **Example   Example   doit Arguments**
   <   >

```
odbedit
mkdir Script
cd Script
mkdir doit
cd doit
create string cmd
ln "/runinfo/run number" run
create string dest
set dest /dev/hda
```

>

/Alias

- **Example   Example**

```
odbedit
ls
create key Alias
cd Alias
ln /Equipment/Trigger/Common "Trig Setting"
ln /Analyzer/Output "Analyzer"
```

```
    create key "Alias new window"                  <-- Version < 1.8.3
    cd "Alias new window"
    ln /equipment/Scalers/Variables "Scalers Var"

or
    cd Alias
    ln /Equipment/Trigger/Common "Trig Setting&"    <-- Version >= 1.8.3
```

Equipment page   ??

mlogger
task   ??

lazylogger task   ??

Title →	MIDAS experiment "midas"		Mon Dec 18 14:42:06 2000			
Action/Pages →	Start	ODB	CNAF	Messages	ELog	Alarms	Programs	History	Config	Help
User botton(s) →	doit	doit2					
Trigger button(s) →	Trigger Scaler event						
Alias/Alias new window →	Trig setting doit_setting						

General Info	Run #63	Stopped	Alarms: On	Restart: Yes	Logging disabled
	Start: Wed Nov 22 10:00:37 2000		Stop: Wed Nov 22 10:01:48 2000		

Equipment listing	Equipment	FE Node	Events	Event rate[/s]	Data rate[kB/s]	Analyzed
	Trigger	feflash@midmes04	7111	0.0	0.0	73.9%
	Scaler	feflash@midmes04	0	0.0	0.0	0.0%

Logger Channels	Channel	Active	Events	MB written	GB total
	0 run00063.mid	Disabled	0	0.000	0.000
	1 run00063.mid	Disabled	0	0.000	0.000

Lazylogger application	Lazy Label	Progress	File Name	# Files	Total
	Disk_01	0 %		0	0.0 %
	Tape_01	0 %		0	0.0 %

Last system message	Mon Dec 18 14:40:06 2000 [mhttpd] Program mhttpd on host midmes04 started

Client listing	feflash [midmes04]	Logger [midmes04]	Lazy_Disk [midmes04]
	Lazy_Tape [midmes04]	mhttpd [midmes04]	

9.12.1   Start page

Start

/Experiment/Edit on Start

Ok   **Cancel**

MIDAS experiment "e614"	Tue Dec 19 09:50:16 2000
Start new run	
Run number	895
Comment	Test, -150 mv th
Write Data	y
Exp type	3 mod test
Operators	SCW RP
Sc 1 HV (volts)	2300
Sc 2 HV (volts)	1800
GAS type	Ar 25 Iso 75
U1 HV (volts)	-2000
V1 HV (volts)	-2000
U2 HV (volts)	-2000
V2 HV (volts)	-1750
U3 HV (volts)	-2000
V3 HV (volts)	-2000
Preamp (mV)	4200
	Start Cancel

Parameter Comments/
Edit

ONLY
odbedit start

```
[local:midas:S]/Experiment>ls -lr
Key name                      Type   #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
Experiment                    DIR
    Name                      STRING 1     32    17s  0   RWD  midas
    Edit on Start             DIR
        Write data            BOOL   1     4     16m  0   RWD  y
        enable                BOOL   1     4     16m  0   RWD  n
        nchannels             INT    1     4     16m  0   RWD  0
        dwelling time (ns)    INT    1     4     16m  0   RWD  0
    Parameter Comments        DIR
        Write Data            STRING 1     64    44m  0   RWD  Enable logging
        enable                STRING 1     64    7m   0   RWD  Scaler for expt B1 only
        nchannels             STRING 1     64    14m  0   RWD  <i>maximum 1024</i>
        dwelling time (ns)    STRING 1     64    8m   0   RWD  <b>Check hardware now</b>

[local:midas:S]Edit on Start>ls -l
Key name                      Type   #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
Write Data                    LINK   1     19    50m  0   RWD  /logger/Write data
enable                        LINK   1     12    22m  0   RWD  /sis/enable
number of channels            LINK   1     15    22m  0   RWD  /sis/nchannels
dwelling time (ns)            LINK   1     24    12m  0   RWD  /sis/dwelling time (ns)
```

MIDAS experiment "midas"	Fri Oct 12 10:33:15 2001
	Start new run
Run number	2
Write Data Enable logging	y
enable Scaler for expt B1 only	n
number of channels *maximum 1024*	0
dwelling time (ns) **Check hardware now**	0
	Start | Cancel

9.12.2 ODB page

Example

9.12.3 Equipment page

/Variables

History system   ??

Names	D_VTp	M_VTp	D_Thres	M_ThresA	M_ThresB	D_TP	M_TP	Temp	Voltage+	Voltage−
Sl_0	0	0	0	0	0	n	n	51	−0.018	−0.006
Sl_1	1850	1852	1011	−1002	−998	n	n	31.3	5.061	−5.103
Sl_2	1793	1793	1017	−1002	−999	n	n	33.8	5.099	−5.112
Sl_3	1775	1774	1023	−1001	−1000	n	n	33.5	5.067	−5.093
Sl_4	1852	1852	1017	−1003	−999	n	n	34.9	5.076	−5.104
Sl_5	1800	1800	1014	−1004	−1000	n	n	38.5	5.055	−5.108
Sl_6	1786	1785	1011	−1001	−1000	n	n	40.4	5.066	−5.098
Sl_7	1798	1798	1011	−1004	−1000	n	n	37.3	5.083	−5.097
Sl_8	1795	1795	1018	−1002	−1002	n	n	32	5.073	−5.092
Sl_9	1801	1801	1016	−1001	−1002	n	n	35.1	5.09	−5.104
Sl_10	1797	1798	1033	−1001	−1000	n	n	34.7	5.065	−5.104
Sl_11	1795	1796	1019	−1000	−1002	n	n	31.3	5.057	−5.102
Sl_12	1797	0	1013	0	0	n	n	0	−0.022	−0.006
Sl_13	1798	1798	1016	−1002	−1000	n	n	34.3	5.067	−5.102
Sl_14	1793	1793	1016	−1000	−1000	n	n	32.4	5.07	−5.095
Sl_15	1799	1800	1015	−1000	−1001	n	n	28.9	5.068	−5.092
Sl_16	1782	1783	1007	−1002	−1001	n	n	37.7	5.058	−5.099
Sl_17	1798	1798	1011	−1001	−999	n	n	33.3	5.104	−5.094
Sl_18	1796	1796	1017	−1001	−1002	n	n	30.6	5.078	−5.103
Sl_19	1798	1797	1009	−1000	−1001	n	n	34.7	5.07	−5.106
Sl_20	1803	1803	1014	−1002	−1000	n	n	37.6	5.066	−5.11
Sl_21	1799	1799	1010	−1000	−1002	n	n	38.7	5.056	−5.11
Sl_22	1805	1805	1015	−1000	−1001	n	n	33.1	5.066	−5.114
Sl_23	1793	1793	1019	−1000	−1001	n	n	31.2	5.055	−5.096
Sl_24	1789	1788	1018	−1000	−1002	n	n	38.1	5.047	−5.105

9.12.4   CNAF page

9.12.5 Message page

9.12.6 Elog page

runlog   **runlog.txt**

/Logger/Data

append

Example   **Exam-**

ple

		MIDAS File Display					Experiment "ltno"			
ELog	Status									

```
Run#   Date     Time     Freq          RF     DVM       Still_H  MC_H      Film_H      Sec  Shunt     Terminal
40034 20001018 16:25:25 0.000000e+00 0.000 0.000001 0.000000 0.000000 0.000000    10 0.056076 0.006103
40035 20001018 16:25:40 7.000000e+07 0.000 0.000002 0.000000 0.000000 0.000000    10 0.058364 0.006027
40036 20001018 16:25:55 7.000000e+07 0.000 0.000006 0.000000 0.000000 0.000000    10 0.058364 0.006027
40037 20001018 16:26:09 7.000000e+07 0.000 0.000005 0.000000 0.000000 0.000000    10 0.058364 0.006027
40038 20001018 16:26:23 7.000000e+07 0.000 0.000006 0.000000 0.000000 0.000000    10 0.058364 0.006027
39000 20001018 17:21:31 7.000000e+07 0.000 0.000008 0.000000 0.102539 0.000000    10 0.059509 0.006256
39001 20001018 17:21:47 7.000000e+07 0.000 0.000005 0.000000 0.102539 0.000000    10 0.056076 0.006103
39002 20001018 17:22:04 7.000000e+07 0.000 0.000003 0.000000 0.102539 0.000000    10 0.056076 0.006103
39003 20001018 17:22:20 7.000000e+07 0.000 0.000002 0.000000 0.102539 0.000000    10 0.056076 0.006103
39004 20001018 17:22:35 7.000000e+07 0.000 0.000002 0.000000 0.102539 0.000000    10 0.056076 0.006103
39000 20001018 17:48:25 7.000000e+07 0.000 0.000006 0.000000 0.102539 0.000000  1000 0.054931 0.006179
39001 20001018 18:05:11 7.000000e+07 0.000 0.000007 0.000000 0.102539 0.000000  1000 0.057220 0.006332
39002 20001018 18:21:56 7.000000e+07 0.000 0.000006 0.000000 0.102539 0.000000  1000 0.056076 0.006256
39003 20001018 18:38:42 7.000000e+07 0.000 0.000008 0.000000 0.102539 0.000000  1000 0.056076 0.006179
39004 20001018 18:55:27 7.000000e+07 0.000 0.000004 0.000000 0.104980 0.000000  1000 0.058364 0.006103
39005 20001018 19:12:14 7.000000e+07 0.000 0.000006 0.000000 0.102539 0.000000  1000 0.053787 0.006332
39006 20001018 19:28:59 7.000000e+07 0.000 0.000005 0.000000 0.104980 0.000000  1000 0.053787 0.006332
39007 20001018 19:45:44 7.000000e+07 0.000 0.000005 0.000000 0.104980 0.000000  1000 0.057220 0.006179
39008 20001018 20:02:32 7.000000e+07 0.000 0.000004 0.000000 0.104980 0.000000  1000 0.062942 0.006256
39009 20001018 20:19:18 7.000000e+07 0.000 0.000005 0.000000 0.104980 0.000000  1000 0.057220 0.006332
39010 20001018 20:36:06 7.000000e+07 0.000 0.000005 0.000000 0.107422 0.000000  1000 0.053787 0.005874
39011 20001018 20:52:52 7.000000e+07 0.000 0.000008 0.000000 0.107422 0.000000  1000 0.057220 0.006256
39012 20001018 21:09:39 7.000000e+07 0.000 0.000006 0.000000 0.107422 0.000000  1000 0.057220 0.006332
```

/Elog/Types /Elog/Systems

9.12.7   Program page

odbedit>   **<**   **>**

9.12.8 History page

History system   ??

">" "+" "-" ">" ">>"

Elog

-

-

-

-

9.12.9 Alarm page

Alarm System **??**

*al_*

9.12.10 Custom page

/Custom/
/Custom/
Alias
/Custom/<page>

- <odb src="odb field">

- <odb src="odb field" edit=1>

- < <
  > >

- < >

- < < >>

- < >
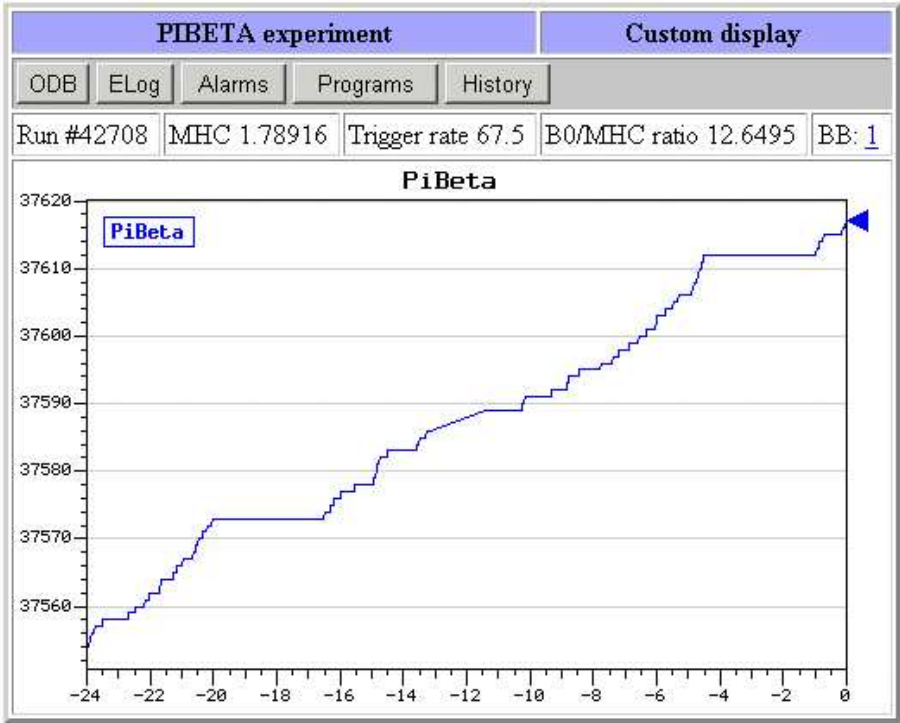
MIDAS experiment "pibeta"   Tue Sep 4 20:02:11 2001

| Find | Create | Delete | Alarms | Programs | Status | Help |

| Create Elog from this page |

/ Custom /

Key	Value
| Overview& | ```
<html>
<head><meta http-equiv="Refresh" content="60">
<title>PIBETA status</title></head>
<body><form method="GET" action="http://……… .psi.ch/CS/Overview&">

<table border=3 cellpadding=2>
<tr><th colspan=3 bgcolor=#A0A0FF>PIBETA experiment<th colspan=3 bgcolor=#A0A0FF>Custom display
</tr>
<tr><td colspan=6 bgcolor=#C0C0C0>
<input type=submit name=cmd value=ODB>
<input type=submit name=cmd value=ELog>
<input type=submit name=cmd value=Alarms>
<input type=submit name=cmd value=Programs>
<input type=submit name=cmd value=History>
</tr>

<tr align=center>
<td>Run #<odb src="/runinfo/run number">
<td>MHC <odb src="/Alias/Rates/MHC">
<td>Trigger rate <odb src="/Alias/Rates/Trigger">
<td colspan=1>B0/MHC ratio <odb src="/Alias/Ratios/B0-MHC">
<td colspan=2>BB: <odb src="/Equipment/Beamline/Variables/Demand[0]" edit=1>
</tr>

<tr><td colspan=6>
<img src="http:// ……… .psi.ch/HS/PiBeta.gif?width=500">
</tr>

</table>
</body></html>

Edit
``` |
| | ```
<html>
<head><meta http-equiv="Refresh" content="60">
<title>PIBETA status</title></head>
``` |

-
-
-

- **Example**

```
Tue> odbedit
[local:midas:Stopped]/>ls
System
Programs
Experiment
Logger
Runinfo
Alarms
Equipment
[local:midas:Stopped]/>mkdir Custom
[local:midas:Stopped]/>cd Custom/
[local:midas:Stopped]/Custom>import mcustom.html
Key name: Test&
[local:midas:Stopped]/Custom>
```

- ONLY-
    ODB(button)

```
Tue> odbedit
[local:midas:Stopped]/>cd Custom/
[local:midas:Stopped]/Custom>export test&
File name: mcustom.html
[local:midas:Stopped]/Custom>
```

-

- Status-

- Example

```
<!doctype html public "-//w3c//dtd html 4.0 transitional//en">
<html>
 <head>
 <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
 <meta name="GENERATOR" content="Mozilla/4.76 [en] (Windows NT 5.0; U) [Netscape]">
 <meta name="Author" content="Pierre-André Amaudruz">
 <title>Set value</title>
 </head>
 <body text="#000000" bgcolor="#FFFFCC" link="#FF0000" vlink="#800080" alink="#0000FF">
 <form method="GET" action="http://host.domain:port/CS/WebLtno&">
 <input type=hidden name=exp value="ltno">
  <center><table CELLSPACING=0 CELLPADDING=0 COLS=3 WIDTH="100%" BGCOLOR="#99FF99" >
  <caption><b><font face="Georgia"><font color="#000099"><font size=+2>LTNO
     Custom Web Page</font></font></font></b></caption>
  <tr BGCOLOR="#FFCC99">
```

```
<td><b><font color="#FF0000">Actions: </font></b>
<input type=submit name=cmd value=Status>
<input type=submit name=cmd value=Start>
<input type=submit name=cmd value=Stop>

<td>
<input type=submit name=cmd value=ODB>
<input type=submit name=cmd value=History>
<input type=submit name=cmd value=Elog></td>
</td>

<td>
<div align=right><b>LTNO experiment </b></div>
</td>
</tr>

<tr>
<td><b>Cryostat section:</b>
<br>LN2 Bath Level : <odb src="/equipment/cryostat/variables/measured[12]">
<br>Run# : <odb src="/runinfo/run number" edit=1>
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number"></td>

<td WIDTH="100%" BGCOLOR="#009900"><b>RF source section:</b>
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number"></td>
<td WIDTH="50%" BGCOLOR="#FF6600"><b>Run section:</b>
<br>Start Time: <odb src="/runinfo/start time">
<br>Stop Time: <odb src="/runinfo/stop time">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number"></td>
</tr>

<tr>
<td BGCOLOR="#CC6600"><b>Sucon magnet section:</b>
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number"></td>

<td BGCOLOR="#FFCC33"><b>Scalers section:</b>
<br>Beam Current: <odb src="/equipment/epics/variables/measured[10]">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number"></td>

<td BGCOLOR="#66FFFF"><b>Polarity section:</b>
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number"></td>
</tr>
</table></center>
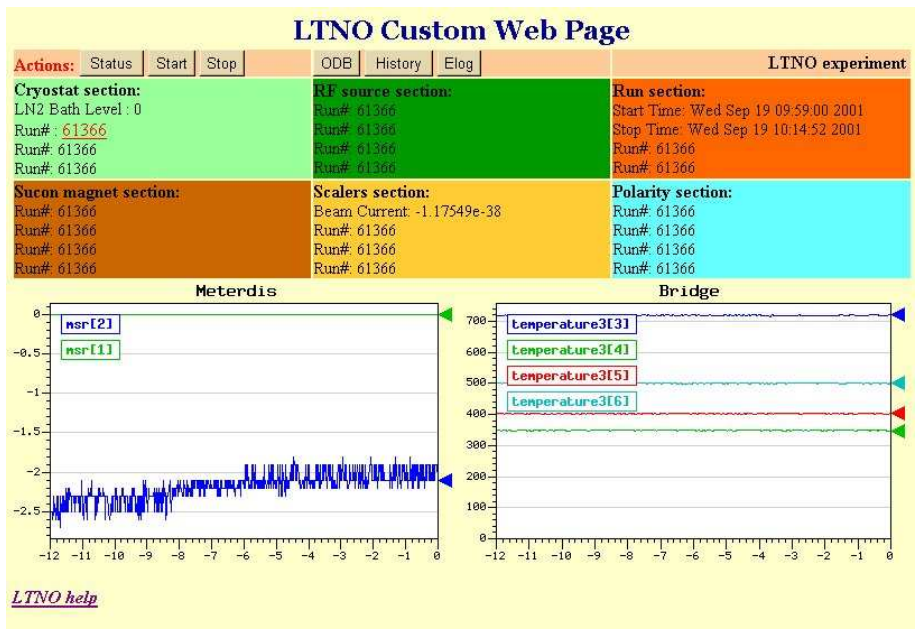
<img src="http://host.domain:port/HS/Meterdis.gif?exp=ltno&scale=12h&width=400">
```

```
<img src="http://host.domain:port/HS/Bridge.gif?exp=ltno&scale=12h&width=400">
<b><i><font color="#000099"><a href="http://host.domain/index.html">
<br> LTNO help</a></font></i></b>
</body>
</html>
```


Utilities   ??   Top   ??   Data format   ??

9.13   New Documented Features

Introduction   **??**   **Top**   **??**   **Quick Start**   **??**

- **Current doc revision: 1.9.3-3**

- **Software version: 1.9.3**

- **Latest tarball :** 1.9.3-1

- **Latest RPM :** 1.9.2-1

-

    - **Epics Slow Control documentation**

-

    - **Analyzer documention revision MIDAS Analyzer**   **??**
    - **Watchdog bug fix (RH9.0)**

- **Restructured Midas distribution**

    -

        download area

- **[DOCUMENTATION in progress]**

    -

        DOC++   Doxygen

        MIDAS Analyzer   **??**
    Quick Start   **??**   **Doxygen**

- **[Midas Short Course]**

–

Part1.pdf, Part2.pdf

- **[1.9.3]**

  –

  – **mlogger task   ??**   **ROOT**
                  root

  – **rmidas task   ??**

  – **MIDAS Analyzer   ??**

  – **Makefile**   **MANA_LITE**   **HAVE_-**
    ROOT   ?? HAVE_HBOOK   ??

  –   **mana hmana rmana**

- **[1.9.2]**

  –   **<   >**

  – **lazylogger task   ??**

  –

  –

  –

  – **cm_cleanup()   ??**

- **[1.9.1]**

  –

CHANGELOG

∗ **[EQ_FRAGMENTED]**

The Equipment structure   ??

∗ **[logger subdir option]**

ODB /Logger Tree   ??

∗

Midas build options and operation con-
siderations   ??

∗ **[MOD. REQ.]**

[db_get_value()   ?? function]
Midas Code and Libraries   ??

[max_event_size_frag]

```
// maximum event size produced by this frontend
INT max_event_size = 10000;
// maximum event size for fragmented events (EQ_FRAGMENTED)
INT max_event_size_frag = 5*1024*1024;
```

– **[/Logger tree]**

– **[general]**

∗

• **[<1.9.1]**

–

Introduction   ??   Top   ??   Quick Start   ??

9.14   ODB Structure

Internal features   **??**   **Top**   **??**   **Data format**   **??**

KEY   **??**
odbedit task   **??**
Midas Code and Libraries   **??**

/Runfinfo   **mlogger**
task   **??**   **/Logger/**

Alias

- **ODB /System Tree**   **??**
- **ODB /RunInfo Tree**   **??**
- **ODB /Equipment Tree**   **??**
- **ODB /Logger Tree**   **??**
- **ODB /Experiment Tree**   **??**
- **ODB /History Tree**   **??**
- **ODB /Alarms Tree**   **??**
- **ODB /Script Tree**   **??**
- **ODB /Alias Tree**   **??**
- **ODB /Elog Tree**   **??**
- **ODB /Programs Tree**   **??**
- **ODB /Lazy Tree**   **??**
- **ODB/EBuilder Tree**   **??**
- **ODB /Custom Tree**   **??**

9.14.1   ODB /System Tree

```
[host:expt:Stopped]/>ls -r -l /system
Key name                     Type    #Val  Size  Last Opn Mode Value
----------------------------------------------------------------------------
System                       DIR
    Clients                  DIR
        29580                DIR
            Name             STRING  1     32    17h  0   R    decay
            Host             STRING  1     256   17h  0   R    host1
            Hardware type    INT     1     4     17h  0   R    42
            Server Port      INT     1     4     17h  0   R    1227
            Transition Mask  DWORD   1     4     17h  0   R    329
            Deferred Transition DWORD 1    4     17h  0   R    6
            RPC              DIR
                16000        BOOL    1     4     17h  0   R    y
                16001        BOOL    1     4     17h  0   R    y
        29638                DIR
            Name             STRING  1     32    17h  0   R    MStatus
            Host             STRING  1     256   17h  0   R    host1
            Hardware type    INT     1     4     17h  0   R    42
            Server Port      INT     1     4     17h  0   R    1228
            Transition Mask  DWORD   1     4     17h  0   R    0
            Deferred Transition DWORD 1    4     17h  0   R    0
        29810                DIR
            Name             STRING  1     32    17h  0   R    Nova_029810
            Host             STRING  1     256   17h  0   R    host
            Hardware type    INT     1     4     17h  0   R    42
            Server Port      INT     1     4     17h  0   R    1235
            Transition Mask  DWORD   1     4     17h  0   R    0
        29919                DIR
            Name             STRING  1     32    17h  0   R    Epics
            Host             STRING  1     256   17h  0   R    host
            Hardware type    INT     1     4     17h  0   R    42
            Server Port      INT     1     4     17h  0   R    1237
            Transition Mask  DWORD   1     4     17h  0   R    329
            Deferred Transition DWORD 1    4     17h  0   R    0
            RPC              DIR
                16000        BOOL    1     4     17h  0   R    y
                16001        BOOL    1     4     17h  0   R    y
        12164                DIR
            Name             STRING  1     32    6s   0   R    ODBEdit
            Host             STRING  1     256   6s   0   R    host2
            Hardware type    INT     1     4     6s   0   R    42
            Server Port      INT     1     4     6s   0   R    4893
            Transition Mask  DWORD   1     4     6s   0   R    0
            Deferred Transition DWORD 1    4     6s   0   R    0
            Link timeout     INT     1     4     6s   0   R    10000
    Client Notify            INT     1     4     6s   0   RWD  0
    Prompt                   STRING  1     256   >99d 0   RWD  [%h:%e:%S]%p>
    Tmp                      DIR
```

Prompt

```
odbedit
[local:midas:Stopped]/>cd /System/
[local:midas:Stopped]/System>ls
Clients
Tmp
Client Notify                     0
Prompt                            [%h:%e:%S]%p>

[local:midas:Stopped]/System>set Prompt my_prompt>
my_prompt>set Prompt [Host:%h-Expt:%e:State:%s]Path:%p>
[Host:local-Expt:midas-State:S]Path:/System>set Prompt [Host:%h-Expt:%e-State:%S]Path:%p>
[Host:local-Expt:midas-State:Stopped]Path:/System>
```

9.14.2   ODB /RunInfo Tree

```
odb -e expt -h host
[host:expt:Running]/>ls -r -l /runinfo
Key name                  Type    #Val  Size  Last Opn Mode Value
-----------------------------------------------------------------
Runinfo                   DIR
    State                 INT     1     4     2h   0   RWD  3
    Online Mode           INT     1     4     2h   0   RWD  1
    Run number            INT     1     4     2h   0   RWD  8521
    Transition in progress INT    1     4     2h   0   RWD  0
    Requested transition  INT     1     4     2h   0   RWD  0
    Start time            STRING  1     32    2h   0   RWD  Thu Mar 23 10:03:44 2000
    Start time binary     DWORD   1     4     2h   0   RWD  953834624
    Stop time             STRING  1     32    2h   0   RWD  Thu Mar 23 10:03:33 2000
    Stop time binary      DWORD   1     4     2h   0   RWD  0
```

- **[State]**

- **[Online Mode]**

- **[Run number]**

- **[Transition in progress]**

- **[Requested transition]**   **Deferred**
  Transition   ??

- [Start Time]

- [Start Time binary]

- [Stop Time]

- [Stop Time binary]

9.14.3 ODB /Equipment Tree

frontend.c ??

```
{
 "DspecCheck",        // equipment name
 ...
 ,
 {
 "Scaler",       // equipment name
 ...
  ,
```

```
Key name                       Type    #Val  Size  Last Opn Mode Value
--------------------------------------------------------------------------
HistoCheck                     DIR
DSpecCheck                     DIR
HistoPoll                      DIR
HistoEOR                       DIR
DSpecEOR                       DIR
Scaler                         DIR
SuconMagnet                    DIR
TempBridge                     DIR
Cryostat                       DIR
Meters                         DIR
RFSource                       DIR
DSPec                          DIR
```

-

-
-

Slow Control System   ??

-

```
[local:S]ls -l -r /equipment/scaler
Key name                       Type    #Val  Size  Last Opn Mode Value
--------------------------------------------------------------------------
Scaler                         DIR
    Common                     DIR
        Event ID               WORD    1     2     16h  0   RWD  1
        Trigger mask           WORD    1     2     16h  0   RWD  256
        Buffer                 STRING  1     32    16h  0   RWD  SYSTEM
        Type                   INT     1     4     16h  0   RWD  1
        Source                 INT     1     4     16h  0   RWD  0
        Format                 STRING  1     8     16h  0   RWD  MIDAS
        Enabled                BOOL    1     4     16h  0   RWD  y
        Read on                INT     1     4     16h  0   RWD  377
        Period                 INT     1     4     16h  0   RWD  1000
        Event limit            DOUBLE  1     8     16h  0   RWD  0
        Num subevents          DWORD   1     4     16h  0   RWD  0
        Log history            INT     1     4     16h  0   RWD  0
        Frontend host          STRING  1     32    16h  0   RWD  midtis03
        Frontend name          STRING  1     32    16h  0   RWD  feLTNO
        Frontend file name     STRING  1     256   16h  0   RWD  C:\online\sc_ltno.c
    Variables                  DIR
        SCLR                   DWORD   6     4     1s   0   RWD
                               [0]               0
                               [1]               0
                               [2]               0
                               [3]               0
                               [4]               0
                               [5]               0
        RATE                   FLOAT   6     4     1s   0   RWD
                               [0]               0
                               [1]               0
                               [2]               0
                               [3]               0
                               [4]               0
                               [5]               0
    Statistics                 DIR
        Events sent            DOUBLE  1     8     1s   0   RWDE 370
        Events per sec.        DOUBLE  1     8     1s   0   RWDE 0.789578
        kBytes per sec.        DOUBLE  1     8     1s   0   RWDE 0.0678543
```

9.14.4   ODB /Logger Tree

mlogger task   ??

```
Key name                     Type   #Val  Size  Last Opn Mode Value
-----------------------------------------------------------------------
Logger                       DIR
    Data dir                 STRING 1     256   4h   0   RWD  /scr0/spring2000
    Message file             STRING 1     256   22h  0   RWD  midas.log
    Write data               BOOL   1     4     2h   0   RWD  n
    ODB Dump                 BOOL   1     4     22h  0   RWD  y
    ODB Dump File            STRING 1     256   22h  0   RWD  run%05d.odb
    Auto restart             BOOL   1     4     22h  0   RWD  y
    Tape message             BOOL   1     4     15h  0   RWD  y
    Channels                 DIR
        0                    DIR
            Settings         DIR
                Active       BOOL   1     4     1h   0   RWD  y
                Type         STRING 1     8     1h   0   RWD  Disk
                Filename     STRING 1     256   1h   0   RWD  run%05d.ybs
                Format       STRING 1     8     1h   0   RWD  YBOS
                ODB Dump     BOOL   1     4     1h   0   RWD  y
                Log messages DWORD  1     4     1h   0   RWD  0
                Buffer       STRING 1     32    1h   0   RWD  SYSTEM
                Event ID     INT    1     4     1h   0   RWD  -1
                Trigger Mask INT    1     4     1h   0   RWD  -1
                Event limit  DWORD  1     4     1h   0   RWD  0
                Byte limit   DOUBLE 1     8     1h   0   RWD  0
                Tape capacity DOUBLE 1    8     1h   0   RWD  0
        Subdir format   STRING  1     32    7h   0   RWD  %Y%m%d
        Current filenameSTRING  1     256   7h   0   RWD  20020605\run00078.mid
          Statistics          DIR
                Events written DOUBLE 1   8     1h   0   RWD  0
                Bytes written  DOUBLE 1   8     1h   0   RWD  0
                Bytes written toDOUBLE 1  8     1h   0   RWD  3.24316e+11
                Files written  INT   1     4     1h   0   RWD  334
```

Data_Dir   ??

/logger/channel/<x>/Settings/Filename

SEPARATOR_DIR   \   Filename
Data_Dir   ??

History system   ??
Data_Dir   ??

Electronic Logbook   ??
Data_Dir   ??

db_copy()   ??


```
[loca]]Logger>cd channels
[local]Channels>ls
0
[local]Channels>copy 0 1
[local]Channels>ls
0
1
```

$$\backslash\, \backslash\, \backslash$$

–

```
<host name>, <port number>, <user name>, <password>, <directory>, <file name>
```

```
myhost.my.domain,21,john,password,/usr/users/data,run%05d.mid
```

Midas format ?? YBOS format ??

- **MIDAS**
- **YBOS**
- **ROOT**
- **ASCII**
- **DUMP**

Buffer Manager ??

Frontend code ??

Bytes written total

Files written

Subdir format

Subdir

—

—

—

—

Current

9.14.5 ODB /Experiment Tree

Name

"Run Parameter/" "Edit
on Start/" "Lock when running/" "Security/"

```
Key name                     Type   #Val Size  Last Opn Mode Value
--------------------------------------------------------------------------
Experiment                   DIR
    Name                     STRING  1    32    22s  0   RWD  chaos
    Run Parameter            DIR
        Beam Polarity        STRING  1    256   2h   0   R    negative
        Beam Momentum        FLOAT   1    4     2h   0   R    91
        2LT: log file name?  STRING  1    256   2h   0   R    cni05
        1LT: file name?      STRING  1    256   2h   0   R    files.cni.zero
        Comment              STRING  1    256   2h   0   R    ch2 target
        Target Angle         FLOAT   1    4     2h   0   R    0
        Target Material      STRING  1    256   2h   0   R    ch2
    Edit on start            DIR
        Beam Momentum        FLOAT   1    4     2h   0   R    91
        Beam Polarity        STRING  1    256   2h   0   R    negative
        Target Material      STRING  1    256   2h   0   R    ch2
        Target Angle         FLOAT   1    4     2h   0   R    0
        1LT: file name?      STRING  1    256   2h   0   R    files.cni.zero
        Trigger 2            BOOL    1    4     2h   0   RWD  n
        2LT: log file name?  STRING  1    256   2h   0   R    cni05
        Comment              STRING  1    256   2h   0   R    ch2 target
        Write data           BOOL    1    4     2h   0   RWD  y
    Lock when running        DIR
        Run Parameter        DIR
            Beam Polarity       STRING  1    256   2h   0   R    negative
            Beam Momentum       FLOAT   1    4     2h   0   R    91
            2LT: log file name? STRING  1    256   2h   0   R    cni05
            1LT: file name?     STRING  1    256   2h   0   R    files.cni.zero
            Comment             STRING  1    256   2h   0   R    ch2 target
            Target Angle        FLOAT   1    4     2h   0   R    0
            Target Material     STRING  1    256   2h   0   R    ch2
    Security                 DIR
        Password             STRING  1    32    16h  0   RWD  #@D&%F56
        Allowed hosts        DIR
            host.sample.domain INT   1    4     >99d 0   RWD  0
            pierre.triumf.ca   INT    1    4     >99d 0   RWD  0
            pcch02.triumf.ca   INT    1    4     >99d 0   RWD  0
            koslx1.triumf.ca   INT    1    4     >99d 0   RWD  0
            koslx2.triumf.ca   INT    1    4     >99d 0   RWD  0
            vwchaos.triumf.ca  INT    1    4     >99d 0   RWD  0
            koslx0.triumf.ca   INT    1    4     >99d 0   RWD  0
        Allowed programs     DIR
            mstat              INT    1    4     >99d 0   RWD  0
            mhttpd             INT    1    4     >99d 0   RWD  0
        Web Password         STRING  1    32    16h  0   RWD  pon4@#@%SSDF2
```

```
[local]/>create key "/Experiment/Run parameters"
```

```
[local]Run parameters>create int "Run mode"
[local]Run parameters>create string Comment
```

/Experiment/Edit

```
[local]/>create key "Experiment/Edit on start"
[local]/>cd "Experiment/Edit on start"
[local]/>ln "/Experiment/Run parameters/Run mode" "Run mode"
```

```
[local]/>start
Run mode [0]:1
Run number [3]:<return to accept>
Are the above parameters correct?
([y]/n/q): <return to accept "y">
Starting run #2
Run #2 started
```

```
[local]/>cd "Experiment/Edit on start"
[local]/>create BOOL "Edit run number"
```

```
[local]/>create key "Experiment/Lock when running"
[local]/>cd "Experiment/Lock when running"
[local]/>ln "/Experiment/Run parameters" "Run parameter"
[local]/>ln "/Logger/Write Data" "Write Data?"
```

```
[local]/>passwd
Password:<xxxx>
Retype password:<xxxx>
```

```
[local]/>rm /Experiment/Security
Are you sure to delete the key
"/Experiment/Security"
and all its subkeys? (y/[n]) y
```

—

—

—

—

```
[local]/>cd "/Experiment/Security/Allowed hosts"
[local]rhosts>create int myhost.domain
[local]rhosts>
```

```
         <      > <       >
```

```
[local]/>cd "/Experiment/Security/Allowed programs"
[local]:S>create int mstat
[local]:S>
```

mhttpd

task   ??

9.14.6   ODB /History Tree

```
[local:midas:S]/History>ls -l -r
Key name                          Type     #Val  Size  Last Opn Mode Value
--------------------------------------------------------------------------
History                           DIR
    Links                         DIR
        System                    DIR
    Trigger per sec.    /Equipment/Trigger/Statistics/Events per sec.
    Trigger kB per sec. /Equipment/Trigger/Statistics/kBytes per sec.

[local:midas:S]/>cd /History/Links/System/
[local:midas:S]System>ls -l
Key name        Type  #Val Size Last Opn Mode Value
-----------------------------------------------------------
Trigger per sec.    LINK  1    46   >99d 0   RWD  /Equipment/Trigger/Statistics/Events per sec.
Trigger kB per sec. LINK  1    46   >99d 0   RWD  /Equipment/Trigger/Statistics/kBytes per sec.
```

mhttpd task   ??

```
[local:midas:S]/History>ls -l -r Display
Key name                          Type     #Val  Size  Last Opn Mode Value
--------------------------------------------------------------------------
Display                           DIR
  Default                         DIR
    Trigger rate                  DIR
        Variables                 STRING   2     32    36h  0   RWD
                                  [0]                      System:Trigger per sec.
                                  [1]                      System:Trigger kB per sec.
        Factor                    FLOAT    2     4     36h  0   RWD
                                  [0]                      1
```

```
                                 [1]              1
         Timescale              INT    1    4    36h  0   RWD  3600
         Zero ylow             BOOL    1    4    36h  0   RWD  y
```

<p align="center">History system   ??</p>

System

9.14.7 ODB /Alarms Tree

<p align="center">"Alarms"</p>
<p align="center">"Classes"</p>

```
odb -e expt -h host
[host:expt:Stopped]/Alarms>ls -lr
Key name                      Type   #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------------
Alarms                        DIR
    Alarm system active       BOOL   1     4     6h   0   RWD  n
    Alarms                    DIR
        Test                  DIR
            Active            BOOL   1     4     31h  0   RWD  n
            Triggered         INT    1     4     31h  0   RWD  0
            Type              INT    1     4     31h  0   RWD  3
            Check interval    INT    1     4     31h  0   RWD  60
            Checked last      DWORD  1     4     31h  0   RWD  0
            Time triggered firstSTRING  1  32    31h  0   RWD
            Time triggered last STRING  1  32    31h  0   RWD
            Condition         STRING 1     256   31h  0   RWD  /Runinfo/Run number > 10
            Alarm Class       STRING 1     32    31h  0   RWD  Alarm
            Alarm Message     STRING 1     80    31h  0   RWD  Run number became too large
        wc3_anode             DIR
            Active            BOOL   1     4     31h  0   RWD  n
            Triggered         INT    1     4     31h  0   RWD  0
            Type              INT    1     4     31h  0   RWD  3
            Check interval    INT    1     4     31h  0   RWD  10
            Checked last      DWORD  1     4     31h  0   RWD  958070825
            Time triggered firstSTRING  1  32    31h  0   RWD
            Time triggered last STRING  1  32    31h  0   RWD
            Condition         STRING 1     256   31h  0   RWD  /equipment/chv/variables/chvv[6] < 900
            Alarm Class       STRING 1     32    31h  0   RWD  Alarm
```

```
            Alarm Message        STRING  1    80    31h  0   RWD  WC3 Anode voltage is too low
        chaos                    DIR
            Active               BOOL    1    4     31h  0   RWD  n
            Triggered            INT     1    4     31h  0   RWD  0
            Type                 INT     1    4     31h  0   RWD  3
            Check interval       INT     1    4     31h  0   RWD  10
            Checked last         DWORD   1    4     31h  0   RWD  0
            Time triggered firstSTRING  1    32    31h  0   RWD
            Time triggered last STRING  1    32    31h  0   RWD
            Condition            STRING  1    256   31h  0   RWD  /Equipment/B12Y/Variables/B12Y[2] < 3000
            Alarm Class          STRING  1    32    31h  0   RWD  Alarm
            Alarm Message        STRING  1    80    31h  0   RWD  CHAOS magnet has tripped.
    Classes                      DIR
        Alarm                    DIR
            Write system messageBOOL    1    4     31h  0   RWD  y
            Write Elog message   BOOL    1    4     31h  0   RWD  n
            System message interINT     1    4     31h  0   RWD  60
            System message last DWORD   1    4     31h  0   RWD  0
            Execute command      STRING  1    256   31h  0   RWD
            Execute interval     INT     1    4     31h  0   RWD  0
            Execute last         DWORD   1    4     31h  0   RWD  0
            Stop run             BOOL    1    4     31h  0   RWD  n
        Warning                  DIR
            Write system messageBOOL    1    4     31h  0   RWD  y
            Write Elog message   BOOL    1    4     31h  0   RWD  n
            System message interINT     1    4     31h  0   RWD  60
            System message last DWORD   1    4     31h  0   RWD  0
            Execute command      STRING  1    256   31h  0   RWD
            Execute interval     INT     1    4     31h  0   RWD  0
            Execute last         DWORD   1    4     31h  0   RWD  0
            Stop run             BOOL    1    4     31h  0   RWD  n
```

9.14.8 ODB /Script Tree

/Script

```
[host::expt:Stopped]/Script>ls
BNMR Hold
Continue
Real
Test
Kill
```

```
[host:expt:Stopped]/Script>ls -lr Continue
Key name          Type    #Val  Size  Last Opn Mode Value
-----------------------------------------------------------
Continue          DIR
    cmd           STRING  1     128   39h  0   RWD  /home/bnmr/perl/continue.pl
    Name          STRING  1     32    28s  0   RWD  bnmr1
    hold          BOOL    1     4     31h  0   RWD  n
```

9.14.9 ODB /Alias Tree

```
odbedit
ls
create key Alias
cd Alias
ln /Equipment/Trigger/Common "Trig Setting" <-- New frame
ln /Equipment/Trigger/Common "Trig Setting&"      <-- Same frame
```

9.14.10 ODB /Elog Tree

mhttpd task   ??

```
[local:midas:S]/Elog>ls -lr
Key name                  Type    #Val  Size  Last Opn Mode Value
-------------------------------------------------------------------
Elog                      DIR
    Email                 STRING  1     64    25h  0   RWD  midas@triumf.ca
    Display run number    BOOL    1     4     25h  0   RWD  y
    Allow delete          BOOL    1     4     25h  0   RWD  n
    Types                 STRING  20    32    25h  0   RWD
                                  [0]               Routine
                                  [1]               Shift summary
                                  [2]               Minor error
                                  [3]               Severe error
                                  [4]               Fix
                                  [5]               Question
                                  [6]               Info
                                  [7]               Modification
                                  [8]               Reply
                                  [9]               Alarm
                                  [10]              Test
                                  [11]              Other
                                  [12]
                                  [13]
```

```
                                           [14]
                                           [15]
                                           [16]
                                           [17]
                                           [18]
                                           [19]
                Systems               STRING  20    32    25h  0    RWD
                                           [0]              General
                                           [1]              DAQ
                                           [2]              Detector
                                           [3]              Electronics
                                           [4]              Target
                                           [5]              Beamline
                                           [6]
                                           [7]
                                           [8]
                                           [9]
                                           [10]
                                           [11]
                                           [12]
                                           [13]
                                           [14]
                                           [15]
                                           [16]
                                           [17]
                                           [18]
                                           [19]
Buttons
                                      8h
                                      24h
                                      3d
                                      7d
Host name                             myhost.triumf.ca
    SMTP host                         STRING  1     64    25h  0    RWD  trmail.triumf.ca
```

$<$ $>$

<div align="center">$<$ $>$</div>

9.14.11   ODB /Programs Tree

<div align="center">**Alarm System   ??**</div>

```
Key name                    Type    #Val  Size   Last Opn Mode Value
--------------------------------------------------------------------------
Programs                    DIR
    EBuilder                DIR
        Required            BOOL    1     4      0s   0   RWD  y
        Watchdog timeout    INT     1     4      0s   0   RWD  10000
        Check interval      DWORD   1     4      0s   0   RWD  10000
        Start command       STRING  1     256    0s   0   RWD  mevb -D
        Auto start          BOOL    1     4      0s   0   RWD  n
        Auto stop           BOOL    1     4      0s   0   RWD  n
        Auto restart        BOOL    1     4      0s   0   RWD  n
        Alarm class         STRING  1     32     0s   0   RWD  Alarm
        First failed        DWORD   1     4      0s   0   RWD  0
```

9.14.12   ODB /Lazy Tree

lazylogger task   ??

```
Key name                    Type    #Val  Size   Last Opn Mode Value
--------------------------------------------------------------------------
Lazy                        DIR
    Tape                    DIR
        Settings            DIR
            Maintain free space(INT  1    4      23h  0   RWD  15
            Stay behind     INT     1     4      23h  0   RWD  -1
            Alarm Class     STRING  1     32     23h  0   RWD
            Running condition STRING 1    128    23h  0   RWD  ALWAYS
            Data dir        STRING  1     256    23h  0   RWD  /data_onl/current
            Data format     STRING  1     8      23h  0   RWD  YBOS
            Filename format STRING  1     128    23h  0   RWD  run%05d.ybs
            Backup type     STRING  1     8      23h  0   RWD  Tape
            Execute after rewindSTRING 1  64     23h  0   RWD  ask_for_tape.sh
            Path            STRING  1     128    23h  0   RWD  /dev/nst0
            Capacity (Bytes) FLOAT  1     4      23h  0   RWD  4.8e+10
            List label      STRING  1     128    3h   0   RWD  tw0078
            Execute before writiSTRING 1  64     23h  0   RWD  lazy_prewrite.csh
            Execute after writinSTRING 1  64     23h  0   RWD  rundb_addrun.pl
        Statistics          DIR
            Backup file     STRING  1     128    3h   0   RWDE run05627.ybs
            File size [Bytes] FLOAT 1     4      3h   0   RWDE 2.00176e+09
            KBytes copied   FLOAT   1     4      3h   0   RWDE 2.00176e+09
```

```
         Total Bytes copied  FLOAT   1    4    3h   0    RWDE 2.00176e+09
         Copy progress [%]   FLOAT   1    4    3h   0    RWDE 100
         Copy Rate [bytes perFLOAT   1    4    3h   0    RWDE 6.21462e+06
         Backup status [%]   FLOAT   1    4    3h   0    RWDE 4.17034
         Number of Files     INT     1    4    3h   0    RWDE 1
         Current Lazy run    INT     1    4    3h   0    RWDE 5627
     List                    DIR
         TW0076              INT     15   4    3h   0    RWD
                                          [0]       5575
                                          [1]       5576
                                          [2]       5577
```

9.14.13   ODB/EBuilder Tree

mevb task   ??

```
Key name                    Type  #Val  Size  Last Opn Mode Value
--------------------------------------------------------------------
EBuilder                    DIR
    Settings                DIR
        Event ID            WORD   1    2    65h  0    RWD  1
        Trigger mask        WORD   1    2    65h  0    RWD  1
        Buffer              STRING 1    32   65h  0    RWD  SYSTEM
        Format              STRING 1    32   65h  0    RWD  YBOS
        Event mask          DWORD  1    4    65h  0    RWD  3
        hostname            STRING 1    64   3h   0    RWD  myhost
    Statistics              DIR
        Events sent         DOUBLE 1    8    3h   0    RWD  653423
        Events per sec.     DOUBLE 1    8    3h   0    RWD  1779.17
        kBytes per sec.     DOUBLE 1    8    3h   0    RWD  0
    Channels                DIR
        Frag1               DIR
            Settings        DIR
                Event ID    WORD   1    2    65h  0    RWD  1
                Trigger mask WORD  1    2    65h  0    RWD  65535
                Buffer      STRING 1    32   65h  0    RWD  YBUF1
                Format      STRING 1    32   65h  0    RWD  YBOS
                Event mask  DWORD  1    4    65h  0    RWD  1
            Statistics      DIR
            Events sent     DOUBLE 1    8    3h   0    RWD  653423
            Events per sec. DOUBLE 1    8    3h   0    RWD  1779.17
            kBytes per sec. DOUBLE 1    8    3h   0    RWD  0
        Frag2               DIR
            Settings        DIR
                Event ID    WORD   1    2    65h  0    RWD  5
                Trigger mask WORD  1    2    65h  0    RWD  65535
                Buffer      STRING 1    32   65h  0    RWD  YBUF2
                Format      STRING 1    32   65h  0    RWD  YBOS
                Event mask  DWORD  1    4    65h  0    RWD  2
            Statistics      DIR
            Events sent     DOUBLE 1    8    3h   0    RWD  653423
            Events per sec. DOUBLE 1    8    3h   0    RWD  1779.17
            kBytes per sec. DOUBLE 1    8    3h   0    RWD  0
```

9.14.14 ODB /Custom Tree

Editable

Custom page **??**

```
Key name                         Type    #Val  Size  Last Opn Mode Value
--------------------------------------------------------------------------
WebLtno&                         STRING  1     2976  25h  0   RWD  <multi-line>
<!doctype html public "-//w3c//dtd html 4.0 transitional//en">
<html>
<head>
   <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
   <meta name="GENERATOR" content="Mozilla/4.76 [en] (Windows NT 5.0; U) [Netscape]">
   <meta name="Author" content="Pierre-Andr?Amaudruz">
   <title>Set value</title>
</head>
<body text="#000000" bgcolor="#FFFFCC" link="#FF0000" vlink="#800080" alink="#0000FF">
<form method="GET" action="http://myhost.triumf.ca:8081/CS/WebLtno&">
<input type=hidden name=exp value="ltno">
<center><table CELLSPACING=1 CELLPADDING=1 COLS=3 WIDTH="100%" BGCOLOR="#99FF99" >
<caption><b><font face="Georgia"><font color="#000099"><font size=+2>LTNO
Custom Web Page</font></font></font></b></caption>

<tr BGCOLOR="#FFCC99">
<td><b><font color="#FF0000">Actions: </font></b>
<input type=submit name=cmd value=Status>
<input type=submit name=cmd value=Start>
<input type=submit name=cmd value=Stop>
...
<td BGCOLOR="#66FFFF"><b>Polarity section:</b>
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number">
<br>Run#: <odb src="/runinfo/run number" edit=1></td>
</tr>
</table></center>

<img src="http://myhost.triumf.ca:8081/HS/Meterdis.gif?exp=ltno&scale=12h&width=400">
<img src="http://myhost.triumf.ca:8081/HS/Bridge.gif?exp=ltno&scale=12h&width=400">
<b><i><font color="#000099"><a href="http://myhost.triumf.ca/ltno/index.html">
<br>
LTNO help</a></font></i></b>
</body>
</html>
```

9.14.15 Hot Link

Control Program

```
...
db_set_value("/Equipment/Trigger/Settings/level1", 321);
...
```

Online Database

```
/Equipment/Trigger/Settings/
    Level1    321
    Level2    123
```

hot-link

Front-end

```
struct {
  int level1;
  int level2;
} trigger_settings;

trigger_update()
{
  set(trigger_settings.level1);
  set(trigger_settings.level2);
}

...
db_open_record("Equipment/
    Trigger/Settings",
    &trigger_settings,
    trigger_update);
...
```

Callback routine
propagates
changes
to hardware

Create hot-link
in main() routine

```
[local]/>cd /Equipment/Trigger/
[local]Trigger>create key Settings
[local]Trigger>cd Settings
[local]Settings>create int level1
[local]Settings>create int level2
[local]Settings>ls
```

make
experim.h **??**

```
[local]Settings>make
```

```
typedef struct {
  INT        level1;
  INT        level2;
  TRIGGER_SETTINGS;

#define TRIGGER_SETTINGS_STR(_name) char *_name[] = {\
"[.]",\
"level1 = INT : 0",\
"level2 = INT : 0",\
"",\
NULL
```

frontend.c **??**

```
#include <experim.h>

TRIGGER_SETTINGS trigger_settings;
```

frontend_init() **??**

```
INT frontend_init()
{
```

```
HNDLE hDB, hkey;
TRIGGER_SETTINGS_STR(trigger_settings_str);

  cm_get_experiment_database(&hDB, NULL);

  db_create_record(hDB, 0,
    "/Equipment/Trigger/Settings",
    strcomb(trigger_settings_str));

  db_find_key(hDB, 0,
    "/Equipment/Trigger/Settings", &hkey);

  if (db_open_record(hDB, hkey,
      &trigger_settings,
      sizeof(trigger_settings), MODE_READ,
      trigger_update) != DB_SUCCESS)
    {
    cm_msg(MERROR, "frontend_init",
      "Cannot open Trigger Settings in ODB");
    return -1;

  return SUCCESS;
```

db_create_record()   ??

db_open_record()   ??

```
void trigger_update(INT hDB, INT hkey)
{
  printf("New levels: %d %d",
    trigger_settings.level1,
    trigger_settings.level2);
```

```
[local]/>cd /Equipment/Trigger/Settings
[local]Settings>set level1 123
[local]Settings>set level2 456
```

```
[local]/>cd /Equipment/Trigger/Settings
[local]Settings>save settings.odb
[local]Settings>set level1 789
[local]Settings>load settings.odb
```

```
#include <midas.h>

main()
{
HNDLE hDB;
INT    level;

  cm_connect_experiment("", "Sample", "Test",
                         NULL);
  cm_get_experiment_database(&hDB, NULL);

  level = 321;
  db_set_value(hDB, 0,
    "/Equipment/Trigger/Settings/Level1",
    &level, sizeof(INT), 1, TID_INT);

  cm_disconnect_experiment();
```

sor

```
 [local]Settings>cd /
[local]/>sor
/Equipment/Trigger/Settings open 1 times by ...
```

9.14.16   History system

mlogger task   ??

- **frontend**

The

Equipment structure ??

- **"Virtual History event"**

ODB /History Tree ??

/equipment/< > < >

/equipment/< > < >

< >
/equipment/< > < >

```
[host:chaos:Running]Target>ls -l -r
Key name                     Type    #Val Size  Last Opn Mode Value
-----------------------------------------------------------------------
Target                       DIR
    settings                 DIR
       Names TGT_            STRING  7    32    10h  0   RWD
                                [0]                      Time
                                [1]                      Cryostat vacuum
                                [2]                      Heat Pipe pressure
                                [3]                      Target pressure
                                [4]                      Target temperature
                                [5]                      Shield temperature
                                [6]                      Diode temperature
    Common                   DIR
         ...
    Variables                DIR
       TGT_                  FLOAT   7    4     10s  0   RWD
                                [0]                      114059
                                [1]                      4.661
                                [2]                      23.16
                                [3]                      -0.498
                                [4]                      22.888
                                [5]                      82.099
```

```
                                            [6]              40
        Statistics                DIR
             ...
```

/equipment/< >

/equipment/< >

/Set-
tings/Names

9.14.17   Alarm System

ONLINE   **ONLY**

-

-

-

-

-

MIDAS experiment "bnmr2"				Sat Aug 5 11:09:49 2000		
Reset all alarms	Alarms on/off	Status				
Evaluated alarms						
Alarm	**State**	**First triggered**	**Class**	**Condition**		**Current value**
Test	Disabled	-	Alarm	/Runinfo/Run number > 100		30327
RF trip	Disabled	-	Pause	/equipment/info odb/variables/RF state = 1		0
Flu_monitor	OK	-	Pause	/equipment/info odb/variables/Fluor monitor counts < 0		0
Program alarms						
Alarm	**State**	**First triggered**	**Class**	**Condition**		
Internal alarms						
Alarm	**State**	**First triggered**	**Class**	**Condition/Message**		

MIDAS experiment "trinat"					Sat Aug 5 11:18:06 2000	
Find	Create	Delete	Alarms	Programs	Status	Help
Create Elog from this page						
/ **Programs** / **Nova_014019** /						
Key			**Value**			
Auto start			n			
Auto stop			n			
Auto restart			n			
Required			n			
Start command			(empty)			
Alarm Class			(empty)			
Checked last			965499475 (0x398C5A53)			
Alarm count			0 (0x0)			
Watchdog timeout			10000 (0x2710)			

MIDAS experiment "trinat"		Sat Aug 5 11:17:30 2000		
Alarms Status				
Program	Running on host	Alarm class	Autorestart	
ODBEdit	midtis01	-	No	Stop ODBEdit
TRINAT_FE	codaq01	-	No	Stop TRINAT_FE
MStatus	midtis01	-	No	Stop MStatus
Logger	midtis01	-	No	Stop Logger
Nova_014019	midtis01	-	No	Stop Nova_014019

Internal features   ??   Top   ??   Data format   ??

9.15   Quick Start

Components   ??   Top   ??   Internal features   ??

This section is under revision to better reflect the latest installation and basic operation of the Midas package.

PSI   TRIUMF

`online CVS web site`

Linux installation   ??   Windows installation   ??

9.15.1   Linux installation

Extraction:

- **Compressed files**

  midas

  ```
  cd /home/mydir
  tar -zxvf midas-1.9.x.tar.gz
  ```

  ```
  >ls
  COPYING  doc/       examples/  include/  linux/     makefile.nt  mscb/   utils/
  CVS/     drivers/  gui/       java/     Makefile*  mcleanup*    src/    vxworks/
  ```

- **RPM Current RPM is not fully up-to-date. We suggest that you use the compressed files or the CVS repository.**
  rpm   /usr/local/bin /usr/local/include /usr/local/lib

- **CVS**   `CVS repository`

  checking out   updating

  ```
  cvs -e ssh -d :ext:cvs@midas.psi.ch:/usr/local/cvsroot checkout midas
  ```

  ```
  cvs -e ssh -d :ext:cvs@midas.psi.ch:/usr/local/cvsroot update
  ```

Installation:
/usr/local/

```
cd /home/mydir/midas
su -
make install
```

Configuration:

- /etc/services :

```
# midas service
midas              1175/tcp                        # Midas server
```

- /etc/xinetd.d/midas :
  midas

```
service midas
{
        flags                   = REUSE NOLIBWRAP
        socket_type             = stream
        wait                    = no
        user                    = root
        server                  = /usr/local/bin/mserver
        log_on_success          += USERID HOST PID
        log_on_failure          += USERID HOST PID
        disable                 = no
}
```

- /etc/ld.so.conf :

```
/usr/local/lib
```

LD_LIBRARY_PATH

- /etc/exptab :

Experiment definition:

exptab   exptab
      /etc/exptab   Environment vari-
ables   ??   **MIDAS_EXPTAB**   ??

exptab

                              experiment name   experiment direc-
tory name   **user name**

```
 #
 # Midas experiment list
 midas   /home/midas/online    midas
 decay   /home/slave/decay_daq  slave
```

                              exptab

                                    Environment variables   ??
MIDAS_DIR   ??   exptab

Compilation & Build:

                                    rmidas
              ROOT   **mana**
HBOOK   **ROOT**   **HAVE_-**
HBOOK   ??   **HAVE_ROOT**   ??

```
 > cd /home/mydir/midas
 > make
 cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
 -o linux/lib/midas.o src/midas.c
 cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
 -o linux/lib/system.o src/system.c
 cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
 -o linux/lib/mrpc.o src/mrpc.c
 cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
 -o linux/lib/odb.o src/odb.c
 cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
 -o linux/lib/ybos.o src/ybos.c
 cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
 -o linux/lib/ftplib.o src/ftplib.c
 rm -f linux/lib/libmidas.a
 ar -crv linux/lib/libmidas.a linux/lib/midas.o linux/lib/system.o linux/lib/mrpc.o
 linux/lib/odb.o linux/lib/ybos.o linux/lib/ftplib.o
 a - linux/lib/midas.o
 a - linux/lib/system.o
 a - linux/lib/mrpc.o
 a - linux/lib/odb.o
 a - linux/lib/ybos.o
 a - linux/lib/ftplib.o
```

```
rm -f linux/lib/libmidas.so
ld -shared -o linux/lib/libmidas.so linux/lib/midas.o linux/lib/system.o
linux/lib/mrpc.o linux/lib/odb.o linux/lib/ybos.o linux/lib/ftplib.o -lutil
-lpthread -lc
cc -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/lib/mana.o src/mana.c
cc -Dextname -DHAVE_HBOOK -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib
-DINCLUDE_FTPLIB -DOS_LINUX -fPIC    -o linux/lib/hmana.o src/mana.c
...
g++ -DHAVE_ROOT -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB
-DOS_LINUX -fPIC   -D_REENTRANT -I/home1/midas/ root/include -o linux/lib/rmana.o
src/mana.c
g++ -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINU
-fPIC   -o linux/lib/mfe.o src/mfe.c
cc -Dextname -c -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib
-DINCLUDE_FTPLIB -DOS_LINUX -fPIC    -o linux/lib/fal.o src/fal.c
...
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mserver src/mserver.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mhttpd src/mhttpd.c src/mgd.c -lmidas -lutil -lpthread -lm
g++ -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-DHAVE_ROOT -D_REENTRANT -I/home1/midas/root/include
-o linux/bin/mlogger src/mlogger.c -lmidas
-L/home1/midas/root/lib -lCore -lCint -lHist -lGraf -lGraf3d -lGpad -lTree
-lRint -lPostscript -lMatrix -lPhysics -lpthread -lm -ldl -rdynamic -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/odbedit src/odbedit.c src/cmdedit.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mtape utils/mtape.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mhist utils/mhist.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mstat utils/mstat.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mcnaf utils/mcnaf.c drivers/bus/camacrpc.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mdump utils/mdump.c -lmidas -lz -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/lazylogger src/lazylogger.c -lmidas -lz -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mchart utils/mchart.c -lmidas -lutil -lpthread
cp -f utils/stripchart.tcl linux/bin/.
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/webpaw utils/webpaw.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/odbhist utils/odbhist.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/melog utils/melog.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/mlxspeaker utils/mlxspeaker.c -lmidas -lutil -lpthread
cc -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-o linux/bin/dio utils/dio.c -lmidas -lutil-lpthread
g++ -g -O2 -Wall -Iinclude -Idrivers -Llinux/lib -DINCLUDE_FTPLIB -DOS_LINUX -fPIC
-DHAVE_ROOT -D_REENTRANT -I/home1/midas/root/include -o linux/bin/rmidas src/rmidas.c
-lmidas -L/home1/midas/root/lib -lCore -lCint -lHist -lGraf -lGraf3d -lGpad
-lTree -lRint -lPostscript -lMatrix -lPhysics -lGui -lpthread -lm -ldl -rdynamic
```

```
-lutil -lpthread
```

Demo examples: **mi-**

das/examples/experiment

Makefile

```
#------------------------------------------------------------------
# The following lines define direcories. Adjust if necessary
#
DRV_DIR   = ../../drivers/bus
INC_DIR   = ../../include
LIB_DIR   = ../../linux/lib
```

```
#------------------------------------------------------------------
# The following lines define direcories. Adjust if necessary
#
DRV_DIR   = /home/mydir/midas/drivers/bus
INC_DIR   = /usr/local/include
LIB_DIR   = /usr/local//lib
```

```
> cd /home/mydir/midas/examples/experiment
> make
gcc -g -O2 -Wall -g -I../../include -I../../drivers/bus -DOS_LINUX -Dextname -c
-o camacnul.o ../../drivers/bus/camacnul.c
g++ -g -O2 -Wall -g -I../../include -I../../drivers/bus -DOS_LINUX -Dextname -o
frontend frontend.c
camacnul.o ../../linux/lib/mfe.o ../../linux/lib/libmidas.a  -lm -lz -lutil
-lnsl -lpthread
g++  -D_REENTRANT -I/home1/midas/root/include -DHAVE_ROOT -g -O2 -Wall -g
-I../../include -I../../drivers/bus -DOS_LINUX -Dextname -o analyzer.o
-c analyzer.c
g++  -D_REENTRANT -I/home1/midas/root/include -DHAVE_ROOT -g -O2 -Wall -g
-I../../include -I../../drivers/bus -DOS_LINUX -Dextname -o adccalib.o -c adccalib.c
g++  -D_REENTRANT -I/home1/midas/root/include -DHAVE_ROOT -g -O2 -Wall -g
-I../../include -I../../drivers/bus -DOS_LINUX -Dextname -o adcsum.o -c adcsum.c
g++  -D_REENTRANT -I/home1/midas/root/include -DHAVE_ROOT -g -O2 -Wall -g
-I../../include -I../../drivers/bus -DOS_LINUX -Dextname -o scaler.o -c scaler.c
g++  -o analyzer ../../linux/lib/rmana.o analyzer.o adccalib.o adcsum.o scaler.o
../../linux/lib/libmidas.a  -L/home1/midas/root/lib -lCore -lCint -lHist -lGraf
-lGraf3d -lGpad -lTree -lRint -lPostscript -lMatrix -lPhysics -lpthread -lm -ldl
-rdynamic -lThread -lm -lz -lutil -lnsl -lpthread
>
```

```
> frontend
  Event buffer size        :      100000
  Buffer allocation        : 2 x 100000
  System max event size    :      524288
  User max event size      :      10000
  User max frag. size      :      5242880
  # of events per buffer :      10


  Connect to experiment ...Available experiments on local computer:
  0 : midas
  1 : root
  Select number:0                        <---- predefined experiment from exptab file

  Sample Frontend connected to <local>. Press "!" to exit                17:27:47
  ===============================================================================
  Run status:   Stopped     Run number 0
  ===============================================================================
  Equipment     Status    Events      Events/sec Rate[kB/s] ODB->FE    FE->ODB
  -------------------------------------------------------------------------------
  Trigger       OK        0           0.0        0.0        0          0
  Scaler        OK        0           0.0        0.0        0          0




  >odbedit
  Available experiments on local computer:
  0 : midas
  1 : root
  Select number: 0
  [local:midas:S]/>start now
  Starting run #1
  17:28:58 [ODBEdit] Run #1 started
  [local:midas:R]/>




  Sample Frontend connected to <local>. Press "!" to exit                17:29:07
  ===============================================================================
  Run status:   Running     Run number 1
  ===============================================================================
  Equipment     Status    Events      Events/sec Rate[kB/s] ODB->FE    FE->ODB
  -------------------------------------------------------------------------------
  Trigger       OK        865         99.3       5.4        0          9
  Scaler        OK        1           0.0        0.0        0          1
```

9.15.2   Windows installation

Extraction:

Installation:

Configuration:

Experiment definition:

Compilation:

Demo examples:

Components   ??   Top   ??   Internal features   ??

Internal features   ??   Top   ??   Data format   ??

- **odbedit task   ??**

  - **ODB Structure   ??**

- **mstat task   ??**

- **analyzer task   ??**

  - **MIDAS Analyzer   ??**

- **mlogger task   ??**

- **lazylogger task   ??**

- **mdump task   ??**

- **mevb task   ??**

- **mspeaker, mlxspeaker tasks   ??**

- **mcnaf task   ??**

- **mhttpd task   ??**

- **melog task   ??**

- **mhist task   ??**

- **mchart task   ??**

- **mtape task   ??**

- **dio task   ??**

- **stripchart.tcl file   ??**

- **rmidas task   ??**

- **hvedit task   ??**

9.15.3 odbedit task

odbedit

ODB Structure   ??

- **Arguments**

- **Usage**

ls $<$ $>$ **ls**

- **Remarks**

```
[local:midas:Stopped]/>help
Database commands ([] are options, <> are placeholders):

alarm                  - reset all alarms
cd <dir>               - change current directory
chat                   - enter chat mode
chmod <mode> <key>     - change access mode of a key
                         1=read | 2=write | 4=delete
cleanup                - delete hanging clients
copy <src> <dest>      - copy a subtree to a new location
create <type> <key>    - create a key of a certain type
create <type> <key>[n] - create an array of size [n]
del/rm [-l] [-f] \<key>  - delete a key and its subkeys
  -l                     follow links
  -f                     force deletion without asking
exec <key>/<cmd>       - execute shell command (stored in key) on server
find <pattern>         - find a key with wildcard pattern
help/? [command]       - print this help [for a specific command]
hi [analyzer] [id]     - tell analyzer to clear histos
ln <source> <linkname> - create a link to <source> key
load <file>            - load database from .ODB file at current position
ls/dir [-lhvrp] [<pat>] - show database entries which match pattern
  -l                     detailed info
  -h                     hex format
  -v                     only value
  -r                     show database entries recursively
  -p                     pause between screens
make [analyzer name]   - create experim.h
mem                    - show memeory <b> Usage </b>
mkdir <subdir>         - make new <subdir>
move <key> [top/bottom/[n]] - move key to position in keylist
msg [user] <msg>       - compose user message
old                    - display old messages
passwd                 - change MIDAS password
pause                  - pause current run
pwd                    - show current directory
resume                 - resume current run
rename <old> <new>     - rename key
rewind [channel]       - rewind tapes in logger
save [-c -s] <file>    - save database at current position
                         in ASCII format
  -c                     as a C structure
  -s                     as a #define'd string
set <key> <value>      - set the value of a key
set <key>[i] <value>   - set the value of index i
set <key>[*] <value>   - set the value of all indices of a key
set <key>[i..j] <value> - set the value of all indices i..j
scl [-w]               - show all active clients [with watchdog info]
shutdown <client>/all  - shutdown individual or all clients
sor                    - show open records in current subtree
start [number] [now] [-v]   - start a run [with a specific number], [without question]
```

```
                             [-v verbose the transaction to the different clients]
stop [-v]                     - stop current run
                             [-v verbose the transaction to the different clients]
trunc <key> <index>      - truncate key to [index] values
ver                      - show MIDAS library version
webpasswd                - change WWW password for mhttpd
wait <key>               - wait for key to get modified
quit/exit                - exit
```

- **Example**

```
>odbedit -c stop
>odbedit
 [hostxxx:exptxxx:Running]/> ls /equipment/trigger
```

9.15.4 mstat task

mstat

-

-

-

-

-

- **Arguments**

odbedit task ??

odbedit task ??

- **Usage**

```
 >mstat -l
 *-v1.8.0- MIDAS status page ------------------------Mon Apr  3 11:52:52 2000-*
 Experiment:chaos        Run#:8699      State:Running          Run time :00:11:34
 Start time:Mon Apr  3 11:41:18 2000

 FE Equip.     Node            Event Taken     Event Rate[/s] Data Rate[Kb/s]
 B12Y          pcch02          67              0.0            0.0
 CUM_Scaler    vwchaos         23              0.2            0.2
 CHV           pcch02          68              0.0            0.0
 KOS_Scalers   vwchaos         330             0.4            0.6
 KOS_Trigger   vwchaos         434226          652.4          408.3
 KOS_File      vwchaos         0               0.0            0.0
 Target        pcch02          66              0.0            0.0

 Logger Data dir: /scr0/spring2000           Message File: midas.log
 Chan.    Active Type       Filename          Events Taken    KBytes Taken
   0      Yes    Disk       run08699.ybs      434206          4.24e+06

 Lazy Label      Progress File name           #files          Total
 cni-53          100[%]   run08696.ybs        15              44.3[%]

 Clients:  MStatus/koslx0        Logger/koslx0           Lazy_Tape/koslx0
           CHV/pcch02            MChart1/umelba          ODBEdit/koslx0
           CHAOS/vwchaos         ecl/koslx0              Speaker/koslx0
           MChart/umelba         targetFE/pcch02         HV_MONITOR/umelba
           SUSIYBOS/koslx0       History/kosal2          MStatus1/dasdevpc
 *--------------------------------------------------------------------------*
```

9.15.5 analyzer task

analyzer   analyzer
        ODB

                                        odbedit task   ??

                            MIDAS Analyzer   ??

 • **Arguments**

     –   <   > <   >

     –

     –

     –   <   >   odbedit
        task   ??

     –

– $<\qquad>$

      odbedit task **??**

– $<\qquad><\qquad>$

–

–

– $<\quad>$

– $<\quad><\quad>$

– $<\quad><\quad><\,>$

– $<\qquad>$

– $<\qquad>$

– $<\qquad>$

–

– $<\quad>$

– $<\quad>$

–

–

- **Remarks**

  –   **experim.h** **??**   **odbedit>** $<\qquad>$ **analyzer** /$<$**Analyzer**$>$/**Parameters**

- **Usage**

```
>analyzer
>analyzer -D -r 9092
>analyzer -i run00023.mid -o run00023.rz -w
>analyzer -i run%05d.mid -o runall.rz -r 23 75 -w
```

9.15.6 mlogger task

mlogger

disk *tape*

The Equipment structure ??
History system ?? ODB
/Logger Tree ??

- **Arguments**

  odbedit task ??
  odbedit task ??

- **Usage**

  ```
  >mlogger -D
  ```

- **Remarks**

  - mlogger-
    /Equipment/-

  -

  -

  -

    \

  -

    mstat task ??
    mhttpd task ??

9.15.7 lazylogger task

lazylogger

mlogger
lazylogger

-

-

- /**Lazy**/<**channel_-**
  name>/

- **Settings**

Settings
List-

- **Arguments**

- **ODB parameters (Settings/)**

```
Settings         DIR
      Maintain free space(%)   INT    1    4      3m   0   RWD   0
      Stay behind              INT    1    4      3m   0   RWD   -3
      Alarm Class              STRING 1    32     3m   0   RWD
      Running condition        STRING 1    128    3m   0   RWD   ALWAYS
      Data dir                 STRING 1    256    3m   0   RWD   /home/midas/online
      Data format              STRING 1    8      3m   0   RWD   MIDAS
      Filename format          STRING 1    128    3m   0   RWD   run%05d.mid
      Backup type              STRING 1    8      3m   0   RWD   Tape
      Execute after rewind     STRING 1    64     3m   0   RWD
      Path                     STRING 1    128    3m   0   RWD
      Capacity (Bytes)         FLOAT  1    4      3m   0   RWD   5e+09
      List label               STRING 1    128    3m   0   RWD
Execute before writing file    STRING 1    64     11h  0   RWD   lazy_prewrite.csh
Execute after writing file     STRING 1    64     11h  0   RWD   rundb_addrun.pl
Modulo.Position                STRING 1    8      11h  0   RWD   2.1
Tape Data Append               BOOL   1    4      11h  0   RWD   y
```

– [Maintain free space]

Maintain

*

The data file corresponding to the given run number following the format declared under "Settings/Filename format" IS PRESENT on the "Settings/Data Dir" path. AND The given run number appears anywhere under the "List/" directory of ALL the Lazy channel having the same "Settings/Filename format"as this channel. AND The given run number appears anywhere under the "List/" directory of that channel

– [Stay behind]

* Example with "Stay behind = -3"

>

always

backup

– [Alarm Class]

– [Running condition]

ALWAYS-

* Example

```
odbedit> set "Running condition" WHILE_ACQ_NOT_RUNNING
odbedit> set "Running condition" "/alias/max_rate \< 200"
```

– [Data dir]

– [Data format]
                    MIDAS   YBOS

– [Filename format]

– [Backup type]
  Tape   Disk   Ftp

– [Execute after rewind]

– [Path]
  *   **/dev/nst0-**
  *   **/data1/myexpt**
  *   **host**

– [Capacity (Bytes)]

– [List label]

– [Exec preW file]
              Arguments

– [Exec postW file]
                Arguments

– [Modulo.Position]

  Modulo.Position

```
Channel     Field     Run#
Lazy_1      3.0       21, 24, 27, ...
Lazy_2      3.1       22, 25, 28, ...
Lazy_3      3.2       23, 26, 29, ...
```

- **[Tape Data Append]**

- **[Statistics/]**

- **[List/]**

- **Usage**

  - **[Step 1]**

    ```
    >lazylogger -c Tape
    ```

  - **[Step 2]**

    ```
    > odbedit -e midas
    [local:midas:Stopped]/>cd /Lazy/tape/
    [local:midas:Stopped]tape>ls
    [local:midas:Stopped]tape>ls -lr
    Key name                       Type    #Val  Size  Last Opn Mode Value
    ----------------------------------------------------------------------------
    tape                           DIR
        Settings                   DIR
            Maintain free space(%) INT     1     4     3m   0   RWD  0
            Stay behind            INT     1     4     3m   0   RWD  -3
            Alarm Class            STRING  1     32    3m   0   RWD
            Running condition      STRING  1     128   3m   0   RWD  ALWAYS
            Data dir               STRING  1     256   3m   0   RWD  /home/midas/online
            Data format            STRING  1     8     3m   0   RWD  MIDAS
            Filename format        STRING  1     128   3m   0   RWD  run%05d.mid
            Backup type            STRING  1     8     3m   0   RWD  Tape
            Execute after rewind   STRING  1     64    3m   0   RWD
            Path                   STRING  1     128   3m   0   RWD
            Capacity (Bytes)       FLOAT   1     4     3m   0   RWD  5e+09
            List label             STRING  1     128   3m   0   RWD
        Statistics                 DIR
            Backup file            STRING  1     128   3m   0   RWD  none
            File size [Bytes]      FLOAT   1     4     3m   0   RWD  0
            KBytes copied          FLOAT   1     4     3m   0   RWD  0
    ```

```
            Total Bytes copied     FLOAT   1    4    3m   0   RWD  0
            Copy progress [%]       FLOAT   1    4    3m   0   RWD  0
            Copy Rate [bytes per s] FLOAT   1    4    3m   0   RWD  0
            Backup status [%]       FLOAT   1    4    3m   0   RWD  0
            Number of Files         INT     1    4    3m   0   RWD  0
            Current Lazy run        INT     1    4    3m   0   RWD  0
  [local:midas:Stopped]tape>cd Settings/
  [local:midas:Stopped]Settings>set "Data dir" /data
  [local:midas:Stopped]Settings>set "Capacity (Bytes)" 15e9
```

- **[Step 3]**

```
  >lazylogger -c Tape -D
```

- **[Step 4]**

mstat task   ??

```
  > odbedit -e midas
  [local:midas:Stopped]/>cd /Lazy/tape/Settings
  [local:midas:Stopped]Settings>set "List label" cni-043
```

- **Remarks**

    - —

Maintain

List

```
Fri Mar 24 14:40:08 2000 [Lazy_Tape] 8351 (rm:16050ms) /scr0/spring2000/run08351.ybs file REMOVED
Fri Mar 24 14:40:08 2000 [Lazy_Tape] Tape run#8351 entry REMOVED
Fri Mar 24 14:59:55 2000 [Logger] stopping run after having received 1200000 events
Fri Mar 24 14:59:56 2000 [CHAOS] Run 8366 stopped
Fri Mar 24 14:59:56 2000 [Logger] Run #8366 stopped
Fri Mar 24 14:59:57 2000 [SUSIYBOS] saving info in run log
Fri Mar 24 15:00:07 2000 [Logger] starting new run
Fri Mar 24 15:00:07 2000 [CHAOS] Run 8367 started
Fri Mar 24 15:00:07 2000 [Logger] Run #8367 started
Fri Mar 24 15:06:59 2000 [Lazy_Tape] cni-043[15] (cp:410.6s) /dev/nst0/run08365.ybs 864.020MB file NEW
Fri Mar 24 15:07:35 2000 [Lazy_Tape] 8352 (rm:25854ms) /scr0/spring2000/run08352.ybs file REMOVED
Fri Mar 24 15:07:35 2000 [Lazy_Tape] Tape run#8352 entry REMOVED
Fri Mar 24 15:27:09 2000 [Lazy_Tape] 8353 (rm:23693ms) /scr0/spring2000/run08353.ybs file REMOVED
Fri Mar 24 15:27:09 2000 [Lazy_Tape] Tape run#8353 entry REMOVED
Fri Mar 24 15:33:22 2000 [Logger] stopping run after having received 1200000 events
Fri Mar 24 15:33:22 2000 [CHAOS] Run 8367 stopped
Fri Mar 24 15:33:23 2000 [Logger] Run #8367 stopped
Fri Mar 24 15:33:24 2000 [SUSIYBOS] saving info in run log
Fri Mar 24 15:33:33 2000 [Logger] starting new run
Fri Mar 24 15:33:34 2000 [CHAOS] Run 8368 started
Fri Mar 24 15:33:34 2000 [Logger] Run #8368 started
Fri Mar 24 15:40:18 2000 [Lazy_Tape] cni-043[16] (cp:395.4s) /dev/nst0/run08366.ybs 857.677MB file NEW
```

```
Fri Mar 24 15:50:15 2000 [Lazy_Tape] 8354 (rm:28867ms) /scr0/spring2000/run08354.ybs file REMOVE
Fri Mar 24 15:50:15 2000 [Lazy_Tape] Tape run#8354 entry REMOVED
...
```

–

–

–

– 　　　　　　　　　　　　$<$　　　　　　　$>$　　$<$　　　　$>$

–

– 　　　　　　　　　　　　　　　　　　　　　　　　　　**lazylogger**

　　　　　　　　　　　　　　　　　Tape_recover.odb　　　　　　**Data_-**
　　Dir ??

9.15.8　mdump task

　　mdump

　　　　　　　mdump

• **Arguments**

　　　　　　　　　　　　　　　　　　　　　　　　$>>>$

>>>

- **Arguments**

>>>

>>>

- **Usage**

```
> mdump -h
> mdump -x -h

Tue> mdump -x run37496.mid | more
----------------------- Event# 0 --------------------------------
----------------------- Event# 1 --------------------------------
Evid:0001- Mask:0100- Serial:1- Time:0x393c299a- Dsize:72/0x48
#banks:2 - Bank list:-SCLRRATE-

Bank:SCLR Length: 24(I*1)/6(I*4)/6(Type) Type:Integer*4
    1-> 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

Bank:RATE Length: 24(I*1)/6(I*4)/6(Type) Type:Real*4 (FMT machine dependent)
    1-> 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
----------------------- Event# 2 --------------------------------
Evid:0001- Mask:0004- Serial:1- Time:0x393c299a- Dsize:56/0x38
#banks:2 - Bank list:-MMESMMOD-

Bank:MMES Length: 24(I*1)/6(I*4)/6(Type) Type:Real*4 (FMT machine dependent)
    1-> 0x3de35788 0x3d0b0e29 0x00000000 0x00000000 0x3f800000 0x00000000

Bank:MMOD Length: 4(I*1)/1(I*4)/1(Type) Type:Integer*4
```

```
       1-> 0x00000001
----------------------- Event# 3 --------------------------------
Evid:0001- Mask:0008- Serial:1- Time:0x393c299a- Dsize:48/0x30
#banks:1 - Bank list:-BMES-

Bank:BMES Length: 28(I*1)/7(I*4)/7(Type) Type:Real*4 (FMT machine dependent)
       1-> 0x443d7333 0x444cf333 0x44454000 0x4448e000 0x43bca667 0x43ce0000 0x43f98000
----------------------- Event# 4 --------------------------------
Evid:0001- Mask:0010- Serial:1- Time:0x393c299a- Dsize:168/0xa8
#banks:1 - Bank list:-CMES-

Bank:CMES Length: 148(I*1)/37(I*4)/37(Type) Type:Real*4 (FMT machine dependent)
       1-> 0x3f2f9fe2 0x3ff77fd6 0x3f173fe6 0x3daeffe2 0x410f83e8 0x40ac07e3 0x3f6ebfd8 0x3c47ffde
       9-> 0x3e60ffda 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x3f800000
      17-> 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
      25-> 0x3f800000 0x3f800000 0x3f800000 0x00000000 0x3f800000 0x00000000 0x3f800000 0x3f800000
      33-> 0x3f800000 0x3f800000 0x3f800000 0x3f800000 0x00000000
----------------------- Event# 5 --------------------------------
Evid:0001- Mask:0020- Serial:1- Time:0x393c299a- Dsize:32/0x20
#banks:1 - Bank list:-METR-

Bank:METR Length: 12(I*1)/3(I*4)/3(Type) Type:Real*4 (FMT machine dependent)
       1-> 0x00000000 0x39005d87 0x00000000
...
```

- **Example**

  ```
  > mdump -j
  ```

9.15.9   mevb task

mevb

>

   mhttpd task   ??   **mevb
task**   ??

- **Arguments**

- **Usage**

```
Thu> mevb -e midas
Program mevb/EBuilder version 2 started
```

- **Event Builder Functions   ??**

9.15.10   mspeaker, mlxspeaker tasks

mspeaker

                                                                              mspeaker
                                                      FirstByte/ProVoice package
            mlxspeaker   Festival

                          mspeaker

- **Arguments**

- **Usage**

```
> mlxspeaker -D
```

9.15.11   mcnaf task

mcnaf

    mcnaf   CAMAC
    drivers   ??

      mfe.c   ??   Building Options   ??
HAVE_CAMAC   ??

- **Arguments**

- **Building application**   midas/utils/makefile
         mcnaf   Ex-
ample

  - **[miocnaf]**
                                                                                      dio
                                                    dio task   ??
  - **[mwecnaf]**
                                    CAMAC   drivers   ??
                        midas@triumf.ca
  - **[mcnaf]**

  - **[mdrvcnaf]**

                                midas@triumf.ca

```
Thu> cd /midas/utils
Thu> make -f makefile.mcnaf DRIVER=kcs2927
gcc -O3 -I../include -DOS_LINUX -c -o mcnaf.o mcnaf.c
gcc -O3 -I../include -DOS_LINUX -c -o kcs2927.o ../drivers/bus/kcs2927.c
gcc -O3 -I../include -DOS_LINUX -o miocnaf mcnaf.o kcs2927.o  ../linux/lib/libmidas.a -lutil
```

```
gcc -O3 -I../include -DOS_LINUX -c -o wecc32.o ../drivers/bus/wecc32.c
gcc -O3 -I../include -DOS_LINUX -o mwecnaf mcnaf.o wecc32.o  ../linux/lib/libmidas.a -lutil
gcc -O3 -I../include -DOS_LINUX -c -o camacrpc.o ../drivers/bus/camacrpc.c
gcc -O3 -I../include -DOS_LINUX -o mcnaf mcnaf.o camacrpc.o  ../linux/lib/libmidas.a -lutil
gcc -O3 -I../include -DOS_LINUX -c -o camaclx.o ../drivers/bus/camaclx.c
gcc -O3 -I../include -DOS_LINUX -o mdrvcnaf mcnaf.o camaclx.o  ../linux/lib/libmidas.a -lutil
rm *.o
```

- **Running application**

  –

                                                                BASE

          >dio miocnaf

  –

          >mcnaf -e <expt> -h <host> -f <fe_name>

- **Usage**

  . . . .

9.15.12 melog task

- **Arguments**

```
<        >
        –  <        > <     >

        –   <     > |    >
```

- **Usage**

```
>melog -h myhost -p 8081 -l myexpt -a author=pierre "Just a elog message"
>melog -h myhost -p 8081 -l myexpt -a author=pierre -f file2attach.txt \
                 "Just this message with an attachement"
>melog -h myhost -p 8081 -l myexpt -a author=pierre -m file_containing_the_message.txt
>melog -h myhost -p 8081 -l myexpt -a Author=pierre -a Type=routine -a system=general \
                 -a Subject="my test" "A full Elog message"
```

- **Remarks**

9.15.13   mhist task

- **Arguments**

- **Usage**

- **Example**

```
--- All variables of event ID 9 during last hour with at least 5 minutes interval.
> mhist
Available events:
ID 9: Target
ID 5: CHV
ID 6: B12Y
ID 20: System

Select event ID: 9

Available variables:
0: Time
1: Cryostat vacuum
2: Heat Pipe pressure
3: Target pressure
4: Target temperature
5: Shield temperature
6: Diode temperature

Select variable (0..6,-1 for all): -1

How many hours: 1

Interval [sec]: 300

Date    Time     Cryostat vacuum Heat Pipe pressure  Target pressure Target temperature      Shield temperature
Jun 19 10:26:23 2000    104444  4.614   23.16   -0.498  22.931  82.163  40
Jun 19 10:31:24 2000    104956  4.602   23.16   -0.498  22.892  82.108  40
Jun 19 10:36:24 2000    105509  4.597   23.099  -0.498  22.892  82.126  40
Jun 19 10:41:33 2000    110021  4.592   23.16   -0.498  22.856  82.08   40
Jun 19 10:46:40 2000    110534  4.597   23.147  -0.498  22.892  82.117  40
Jun 19 10:51:44 2000    111046  4.622   23.172  -0.498  22.907  82.117  40
Jun 19 10:56:47 2000    111558  4.617   23.086  -0.498  22.892  82.117  40
Jun 19 11:01:56 2000    112009  4.624   23.208  -0.498  22.892  82.117  40
Jun 19 11:07:00 2000    112521  4.629   23.172  -0.498  22.896  82.099  40
Jun 19 11:12:05 2000    113034  4.639   23.074  -0.498  22.896  82.117  40
Jun 19 11:17:09 2000    113546  4.644   23.172  -0.498  22.892  82.126  40
Jun 19 11:22:15 2000    114059  4.661   23.16   -0.498  22.888  82.099  40
```

•

```
 mhist -e 5 -v "I-WC1+_Anode" -t 3600 -s 240400 -p 250400
Apr 24 00:00:09 2000    160
Apr 24 01:00:12 2000    160
Apr 24 02:00:13 2000    160
Apr 24 03:00:14 2000    160
Apr 24 04:00:21 2000    180
Apr 24 05:00:26 2000    0
Apr 24 06:00:31 2000    160
Apr 24 07:00:37 2000    160
Apr 24 08:00:40 2000    160
Apr 24 09:00:49 2000    160
Apr 24 10:00:52 2000    160
Apr 24 11:01:01 2000    160
Apr 24 12:01:03 2000    160
```
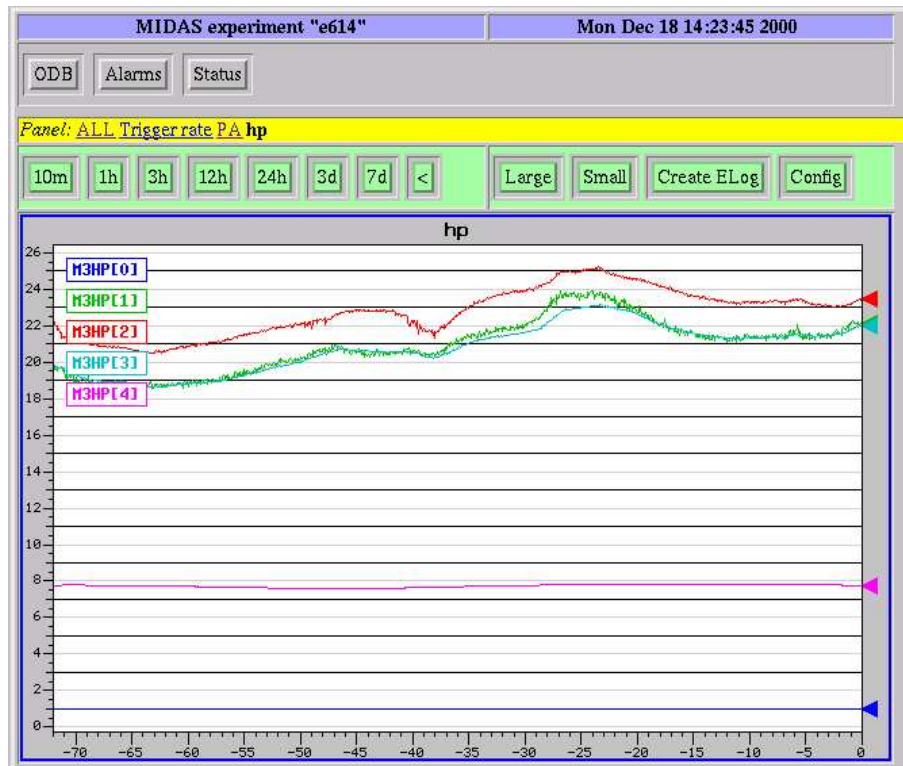
```
Apr 24 13:01:03 2000       0
Apr 24 14:01:04 2000       0
Apr 24 15:01:05 2000      -20
Apr 24 16:01:11 2000       0
Apr 24 17:01:14 2000       0
Apr 24 18:01:19 2000      -20
Apr 24 19:01:19 2000       0
Apr 24 20:01:21 2000       0
Apr 24 21:01:23 2000       0
Apr 24 22:01:32 2000       0
Apr 24 23:01:39 2000       0
```

- **Remarks**

    mhttpd task   ??

- **Example**

9.15.14 mchart task

-

  file.conf

-

- gstripchart

- stripchart.tcl file ??

- Arguments

- **Usage**

stripchart

MCHART_DIR   ??

Environment variables   ??

```
chaos:~/chart> more trigger.conf
#Equipment:              >/equipment/kos_trigger/statistics
menu:                    on
slider:                  on
type:                    gtk
minor_ticks:             12
major_ticks:             6
chart-interval:          1.000
chart-filter:            0.500
slider-interval:         0.200
slider-filter:           0.200
begin:        Events_sent
  filename:   /home/chaos/chart/trigger
  fields:     2
  pattern:    Events_sent
  equation:   \$2
  color:      \$blue
  maximum:    1083540.00
  minimum:    270885.00
  id_char:    1
end:          Events_sent
begin:        Events_per_sec.
  filename:   /home/chaos/chart/trigger
  fields:     2
  pattern:    Events_per_sec.
  equation:   $2
  color:      \$red
  maximum:    1305.56
  minimum:    326.39
  id_char:    1
end:          Events_per_sec.
begin:        kBytes_per_sec.
  filename:   /home/chaos/chart/trigger
  fields:     2
  pattern:    kBytes_per_sec.
  equation:   $2
  color:      \$brown
  maximum:    898.46
  minimum:    224.61
  id_char:    1
```

```
end:            kBytes_per_sec.
```

mchart-

```
chaos:~/chart> more trigger
  Events_sent 6.620470e+05
  Events_per_sec. 6.463608e+02
  kBytes_per_sec. 4.424778e+02
```

- **Example**

  -

    ```
    chaos:~/chart> mchart -f chvv -q /equipment/chv/variables/chvv -c
    chaos:~/chart> ls -l chvv*
    -rw-r--r--    1 chaos    users           474 Apr 18 14:37 chvv
    -rw-r--r--    1 chaos    users          4656 Apr 18 14:37 chvv.conf
    ```

  -

    ```
    mchart -e myexpt -h myhost -f chv -q /equipment/chv/variables -c
    ```

  -

    ```
    chaos:~/chart> mchart -f chv -q /equipment/chv/variables -d
    CHVV : size:68
    #name:17 #Values:17
    CHVI : size:68
    ```

  -

    ```
    chaos:~/chart> mchart -f chv.conf -d
    CHVV : size:68
    #name:17 #Values:17
    CHVI : size:68
    #name:17 #Values:17
    ```

  -

    gstripchart   ??

    ```
    chaos:~/chart> mchart -f chv.conf -gg
    spawning graph with gstripchart -g 500x200-200-800 -f /home/chaos/chart/chv.conf ...
    ```

  -

    ```
    chaos:~/chart> mchart -f chv.conf -gh
    spawning graph with stripchart /home/chaos/chart/chv.conf ...
    ```

9.15.15   mtape task

- **Arguments**

- **Usage**
- **Example**

    >mtape

9.15.16   dio task

                                                                                                   dio-

- **Arguments**

- **Usage**

    >dio miocnaf
    >dio frontend

- **Remark**

-

-

-

9.15.17 stripchart.tcl file

mchart task   **??**
History system   **??**

- **Arguments**
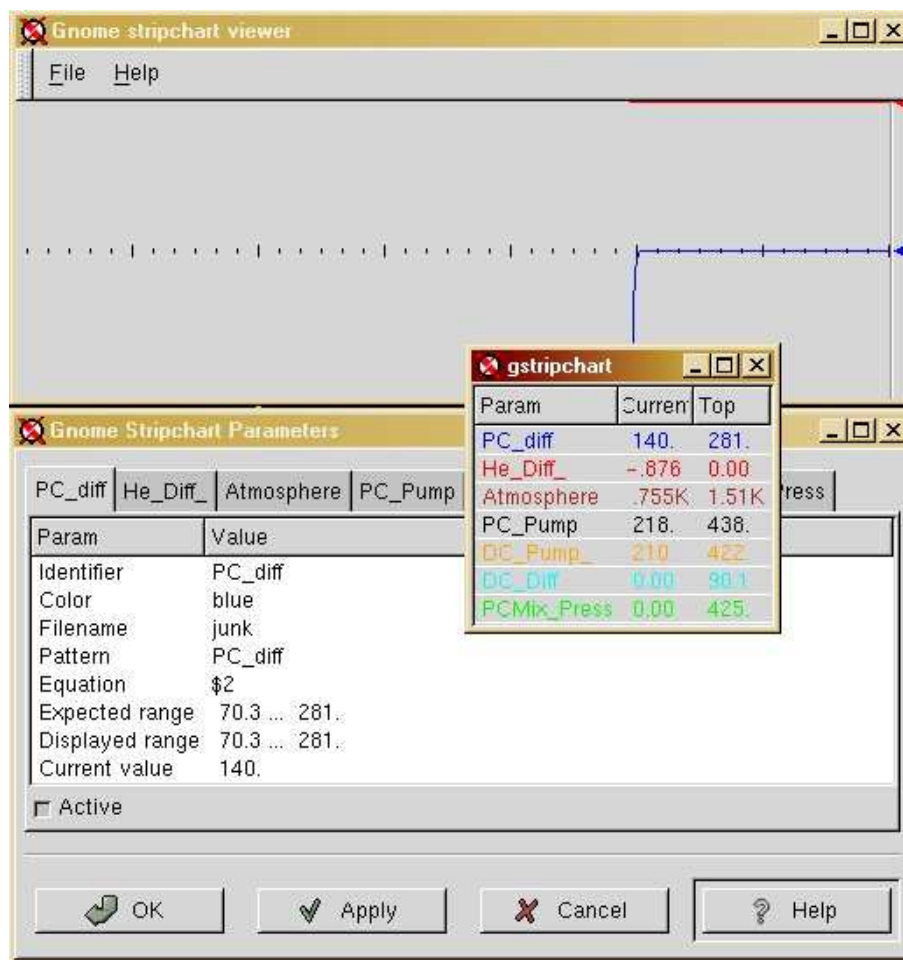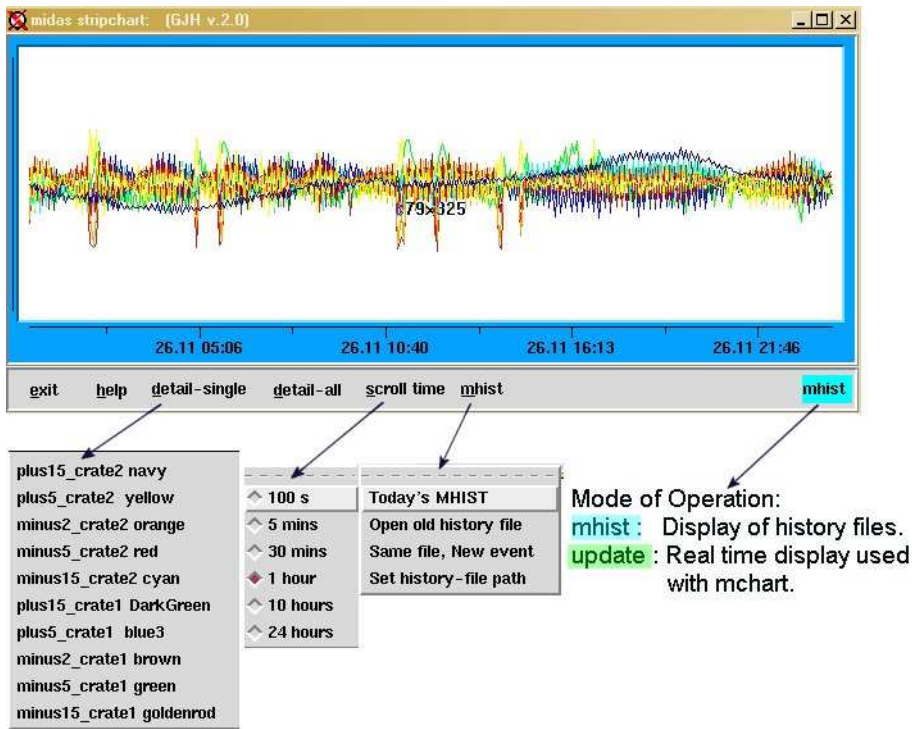
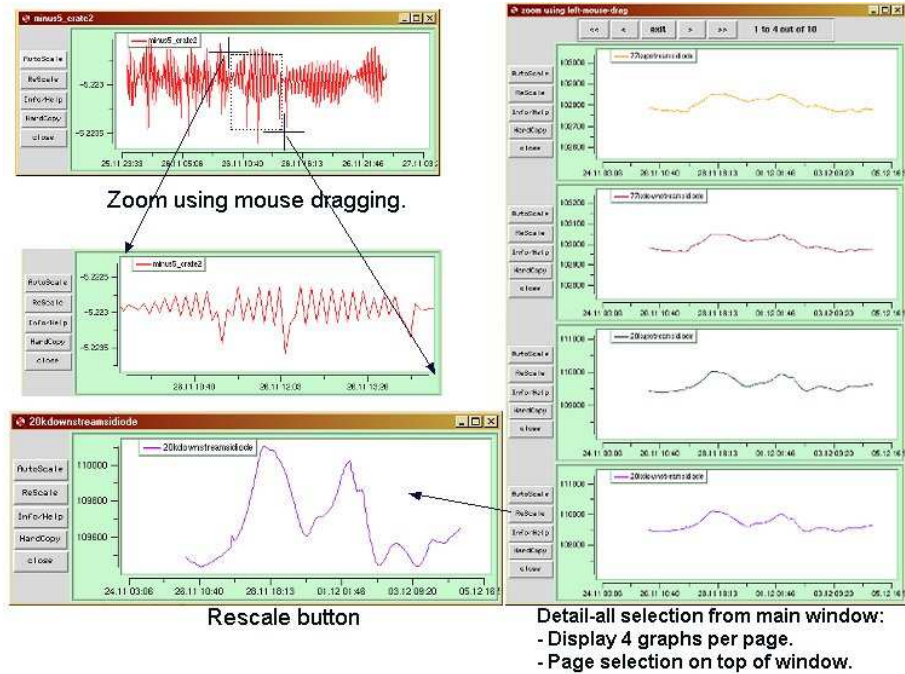- **Usage** $<$ $> <$ $>$

```
> stripchart.tcl -debug
> stripchart.tcl
```

- **Example**

```
> stripchart.tcl -h
```

Zoom using mouse dragging.

Rescale button

Detail-all selection from main window:
- Display 4 graphs per page.
- Page selection on top of window.

9.15.18 rmidas task

- **Arguments**

- **Usage**

- **Example**
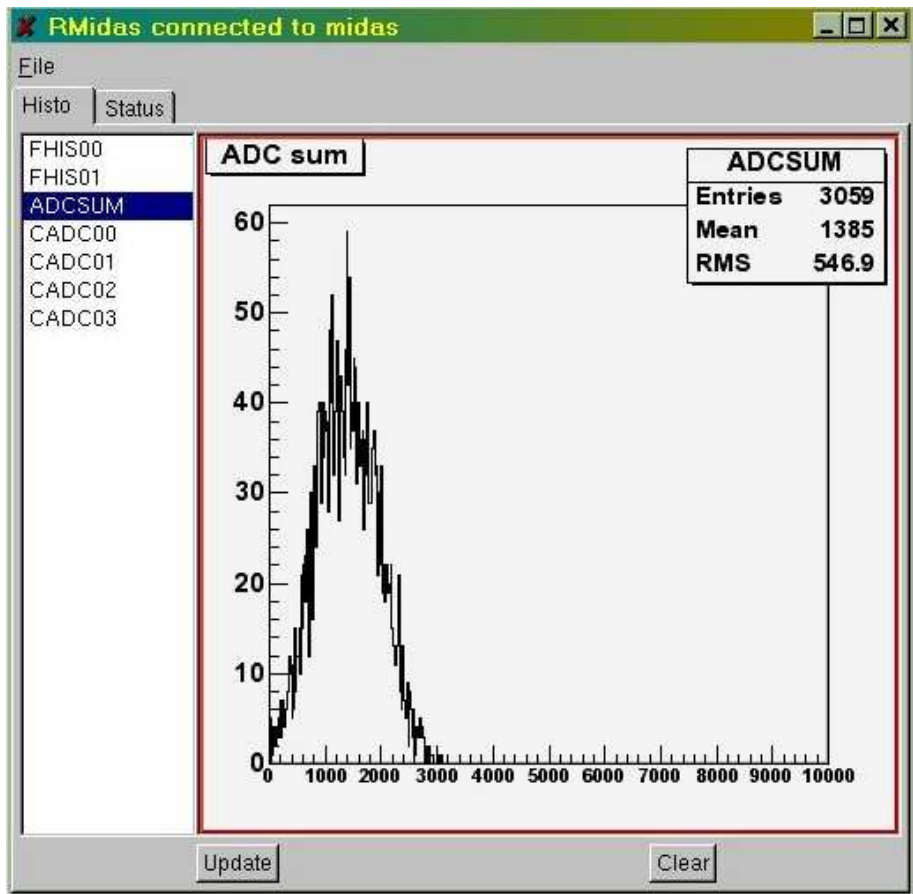
  ```
  >rmidas midasserver.domain
  ```

9.15.19 hvedit task

- **Arguments**

- **Usage**

- **Example**

  ```
  >hvedit
  ```