



- Midas Deployment.
- Known Midas implementations.
- Utilities and usage.
- Features & Hidden Features.

Midas Deployment.



Europe	Canada
Bari - INFN, Italy Fribourg University, Switzerland Kascade-Grande, Karlsruhe Trieste - INFN, Italy Uppsala University, Uppsala, Finland ...	Carlton University, Ottawa Montreal University, Quebec, Canada Northern British Columbia University, BC, Canada Regina University, Regina, Saskatchewan, Canada Queen's University / NRCC, Ottawa, ON, Canada Victoria University, Victoria, BC, Canada Fuel Cell Technologies, Ontario, Canada ...
USA	Other
Argonne National Lab, Chicago Brookhaven National Lab, NY Boulder, Colorado University Colorado School of Mines, Colorado CalTech, California Kentucky University LANL Los Alamos Michigan University Notre-Dame University, Indiana Virginia Tech, Virginia, VA ...	JI NR, Dubna Russia Peking University, China ...



The Midas software package wouldn't have been that good without the contribution of the following people and ... potential users like you!

• Suzannah Daviel	DAQ, Triumf	μ Sr, β nmr.
• Peter Green	DAQ, Uni. of Alberta	NOVA analyzer.
• Greg Hackman	Triumf	8π , J73a SCSI driver.
• Gertjan Hofman	Triumf	CHAOS, stripchart.tcl.
• Paul Knowles	Uni. of Fribourg	rpm packaging, documentation.
• Rudi Meier	Uni. of Tuebingen	CHAOS, monitoring.
• Glenn Moloney	Uni. of Melbourne	CHAOS, Linux Camac drivers.
• Dave Morris	Triumf	SlowControl, Java.
• Konstantin Olchanski	DAQ, Triumf	Twist, SlowControl, ROOT.
• Renee Poutissou	DAQ, Triumf	Twist, web interface, mevb, lazylogger.
• Andreas Suter	PSI	Hvedit Qt interface.
• Piotr Adam Zolnierczuk	Uni. of Kentucky	rpm packaging.

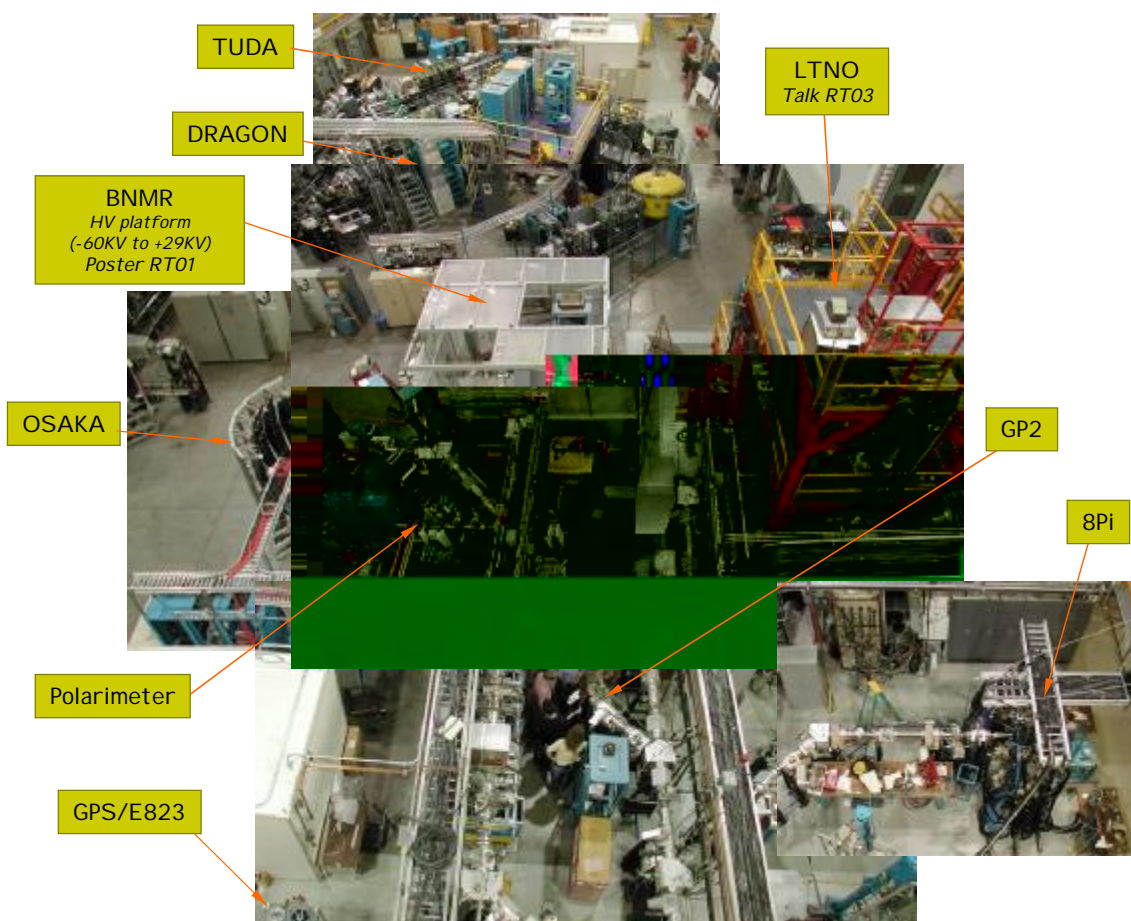
Known Midas implementations I .



Use	Location	#Nodes	#FE	#EQ	#Poll	#SC	#Client	Data Rate	Hardware	OS	Comments
TWIST	TRIUMF	4	R3	12	2	8	15	6MB/s	VME/FB/CAMAC, Network/GPIB	VxWorks, Linux	Dual Logger, LazyLogger mevb, multiple nodes.
CHAOS (retired)	TRIUMF	4	R3	8	1	1	11	4MB/s	FB/CAMAC/VME	VxWorks, Linux, W2K	Dual logger, Lazylogger.
LTNO	TRIUMF	2	R1	18	1	11	9	< 50KB/s	CAMAC(DSP004), Network, GPIB, RS232	W2K, Linux	Hardware Histograms Readout, Software Histograms Readout, Large #SC, Qt run control.
Dragon	TRIUMF	2	R1	5	1	0	8	< 50KB/s	CAMAC(HYTEC)	Linux	Buffered events, PAW, Lazylogger.
TUDA	TRIUMF	3	R1	2	1	0	4	< 100KB/s	VME/ CAMAC(CBD8210)	VxWorks, Linux/Solaris	MIDAS-UK Solaris.
TRINAT	TRIUMF	2	R1	4	1	0	4	< 100KB/s	VME/ CAMAC(CBD8210)	VxWorks, Linux	User code for PM gain control in FE, NOVA.
BetaNMR	TRIUMF	3	R1	9	1	2	6	< 50KB/s	VME(MVME162), SIS3801	VxWorks, Linux	Software Histogram Readout, Epics, Cycle Ctl within FE.
Polarimeter	TRIUMF	1	R1	3	1	0	2	< 50Kb/s	VME(MVME162)	VxWorks, Linux	SC(Epics).
μSRs (3)	TRIUMF	2	R1	5	1	0	3	< 50KB/s	VME/ CAMAC(CBD8210)	VxWorks, Linux	Software Histogram Readout, Large Event, Manual trigger.
Multi	TRIUMF	2	R1	3	1	0	5	2MB/s	VME/FastBus	VxWorks, Linux	FB data, filter in FE.
8Pi	TRIUMF	2	R1	2	1	0	3	100KB/s	VME(MVME162), CAMAC(CBD8210), SIS3801	VxWorks, Linux	FERA/VME, CAMAC

Use	Location	# Nodes	# FE	# EQ	# Poll	# SC	# Client	Data Rate	Hardware	OS	Comments
GPS (2)	TRIUMF	1	1	3	2	0	4	50KB/s	CAMAC(KCS2927)	Linux	Deferred Transition, Tiny events NOVA, 2Polls eqp.
Kopio (2)	TRIUMF	1	1	2	1	0	3	< 100KB/s	CAMAC(HYTEC)	Linux	PAW.
Dragon I	TRIUMF	1	1	2	1	0	3	< 100KB/s	CAMAC(HYTEC)	Linux	PAW.
Tigress I	TRIUMF	2	R1	2	1	0	4	< 100KB/s	CAMAC(HYTEC)	VxWorks, Linux	Java control (JACQ).
DANCE (planned)	LANL	15	14					1MB/s	VME(MVME162)	Linux	mevb, ROOT.
MULAN	PSI	12	10				20	5-10MB/s	PCI/ CAMAC(HYTEC)	Linux	mevb, ROOT.
Teaching	Uni. of Northern BC	1	1	2	1	0	3	< 50KB/s	CAMAC(SCSI)	Linux	PAW, simple.
Carleton	Ottawa	1	1	2	1	0	3	< 50KB/s	VME(SIS3100)	Linux	Multiple Flash ADCs, Hardware Histogram Readout, PAW.
PIBETA	PSI	4	2	6	1	4	5	< 100KB/s	VME(SBS617) FB(STR340) CAMAC(HYTEC)	W2K, Linux	PAW, Dual Lazylogger(FTP+Tape)
LEM	PSI	3	1	6	2	4	8	3kb/s	CAMAC(HYTEC)	NT4, Linux	PAW
Det. Group	PSI	1	1	2	1	0	1	1MB/s	CAMAC(HYTEC)	WXP	Fal, PAW
MEG (planned)	PSI	20	5	7	1	5	10	120MB/s	VME(SIS3100)	Linux	mevb, ROOT

Midas TRIUMF I - ISAC I



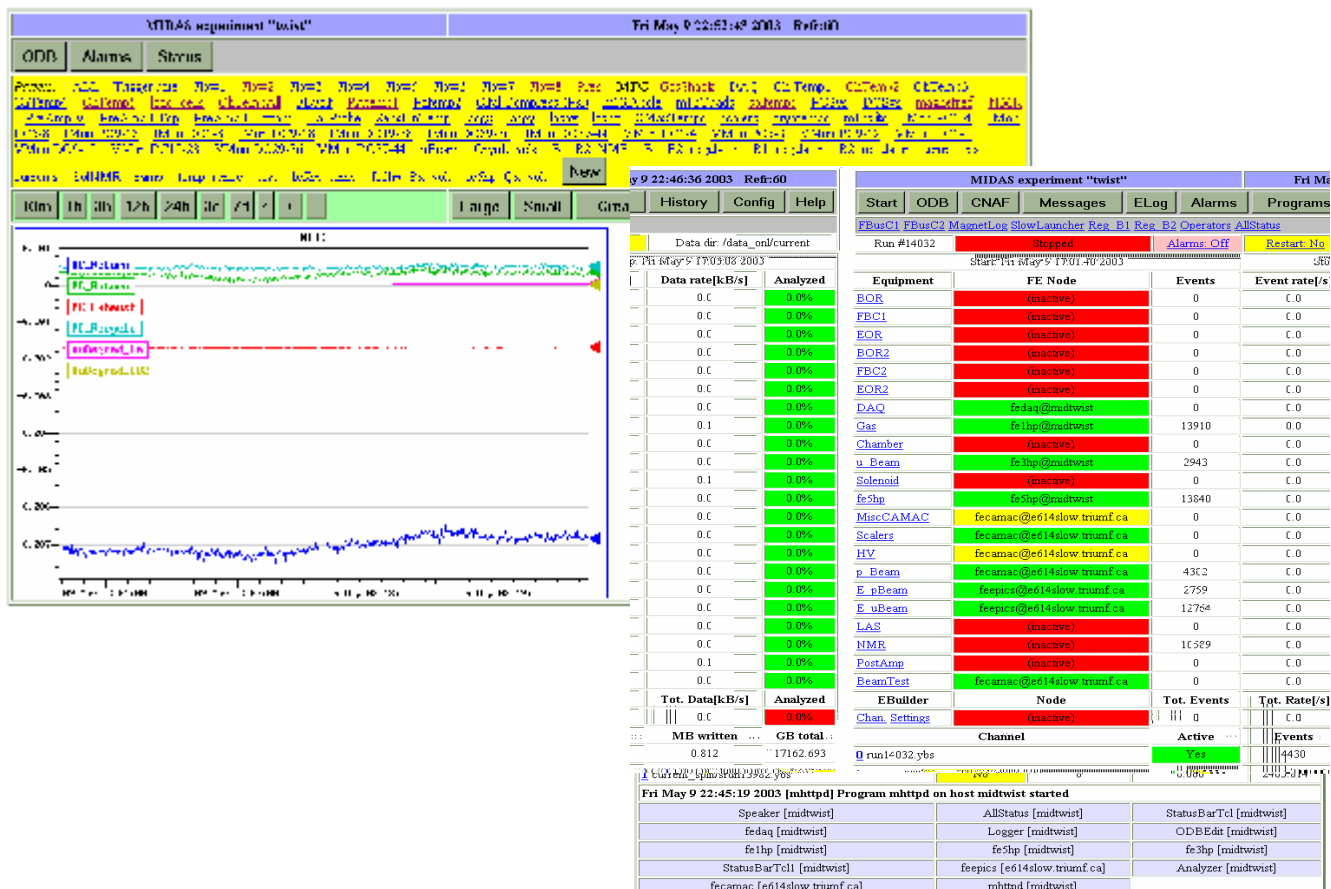
- See RT03 – Poster
The TWI ST Data Acquisition System at TRIUMF



Midas Short Course - Real Time 2003 - Montreal - Part I I

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Twist



Provide user access to the Midas system for data storing and retrieval, experiment configuration and monitoring as well as debugging tools.

Reviewed in the following sides & documented on: midas.psi.ch

odbedit	Online DataBase Editor.
dio	Program launcher for Direct IO access.
mstat	Status display.
mdump	Event display utility.
mlogger	Multi channel Data logger and history data collector.
mhst	History data utility.
mchart	ODB data for stripchart utility.
stripchart.tcl	Tcl/Tk history/ODB data stripchart display.
mspeaker, mlxspeaker	Message speech synthesizer.
mcnaf	CAMAC utility.
lazylogger	Multi channel background data copier.
mevb	Event Builder.

Documented on: midas.psi.ch

analyzer	Online / offline analyzer.
mhttpd	Web server.
melog	Electronic LogBook utility.
mtape	Tape utility.
hvedit task	HV or Slow control Windows/Qt application.

odbedit

Online database Editor.

Main application for interaction with the Online Database.

- Implements most of the midas functions.
- Run control (start/stop)
- Shell (recall, tab completion)
- Command line (odbedit -c ...)

```
C:\>\odbedit
[local:midas:S]/>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 [clientname] - 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
                    follow links
                    -l force deletion without asking
                    -f execute shell command (stored in key) on server
exec <key>/<cmd>      - import key into ASCII file
exp <key> <filename>  - find a key with wildcard pattern
find <pattern>        - print this help [for a specific command]
help/? [command]     - tell analyzer to clear histos
hi [analyzer] [id]   - import ASCII file into string key
imp <filename> [key]  - create a link to <source> key
ln <source> <linkname> - load database from .ODB file at current position
load <file>          - hit return for more
                    --
ls/dir [-lhvrp] [<pat>] - show database entries which match pattern
                    -l, -h, -v, -r, -p See online help
make [analyzer name] - create experim.h
mem [-v]             - show memory usage [verbose]
mkdir <subdir>       - make new <subdir>
move <key> [top/bottom/[n]] - move key to position in keylist
msg [type] [user] <msg> - compose user message
old [n]              - display old n messages
passwd              - change MIDAS password
pause              - pause current run
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],
                    [now] w/o asking parameters, [-v] debug output
stop [-v]           - stop current run, [-v] debug output
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
```

Application launcher meant to give to the program privileges for I/O port access. Overcome the necessity to have specific OS driver for each interface.

By accessing directly the IO ports, the launched program has full R/W access to IO port. Device access through that port is faster, but multiple instance of such task running simultaneously may generate IO collision resulting in wrong data transfer to bus timeout.

```
/* Grant access to the device's ioports */
iopt() // change I/O privilege level
```

```
File: start_dragon04_fe
#!/bin/csh
/usr/local/bin/dio fedragon -e dragon -h dragon04.triumf.ca
```

Dragon

Midas ASCII status display (VT100 display). Precursor of the Web interface.

The data are retrieved from the different ODB locations.

Odb>ls /Runinfo Odb>ls /Experiment	Run Info	<pre>*-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</pre>				
Odb>ls /Equipment	Equipment listing	<pre>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</pre>				
Odb>ls /Logger	Logger channel	<pre>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</pre>				
Odb>ls /Lazy	Lazy logger	<pre>Lazy Label Progress File name #files Total cni -53 100[%] run08696.ybs 15 44.3[%]</pre>				
Odb>ls /System Odb>ls /Programs	Client listing	<pre>Clients: MStatus/kosl x0 Logger/kosl x0 Lazy_Tape/kosl x0 CHV/pcch02 MChart1/umelba ODBEdit/kosl x0 CHAOS/vwchaos ecl/kosl x0 Speaker/kosl x0 MChart/umelba targetFE/pcch02 HV_MONITOR/umelba SUSIYBOS/kosl x0 Hi story/kosal 2 MStatus1/dasdevpc</pre>				

		CHAOS				

Debugging application: allow to display the events (banks) during acquisition or from a save-set file (file.mid)

Meant for debugging and data consistency check. mdump displays the "bank" data.

```
Mon> mdump -e tigress -h midtig01 -f d | more
-1.9.1 -- Enter <|> to Exit ----- Midas Dump ---
----- Event # 1 -----
Evid: 0001- Mask: 0000- Serial: 7439022- Time: 0x3eb695af- Dsi ze: 19840/0x4d80
#banks: 18 - Bank list: - POSI DGF1SI A0SI A1SI A2SI A3SI A4SI A5SI A6SI A7SI B0SI B1SI B2SI B3SI
B4SI B5SI B6SI B7-

Bank: POSI Length: 8(I*1)/2(I*4)/2(Type) Type: Real *4 (FMT machine dependent)
1-> 0.000e+00 0.000e+00

Bank: DGF1 Length: 3290(I*1)/822(I*4)/1645(Type) Type: Unsigned Integer*2
1-> 1645 1 4352 1299 33320 34813 15 33320
9-> 37430 409 44557 7297 18692 0 0 0
17-> 0 1299 6100 6100 6060 6008 6072 6104
25-> 6076 6048 6040 6068 6088 6048 6032 6068
33-> 6084 6072 5988 5956 5948 5936 6048 6136
41-> 6120 6120 6152 6176 6116 6024 6012 6032
49-> 6064 6088 6228 6204 6136 6180 6176 6172
57-> 6156 6056 6004 6012 5988 6000 6088 6172
65-> 6180 6140 6160 6156
73-> 6096 6104 6148 6084
81-> 6072 6020 6064 6136
```

Tigress

```
Sun> mdump -e tigress -h midtig01 -s
```

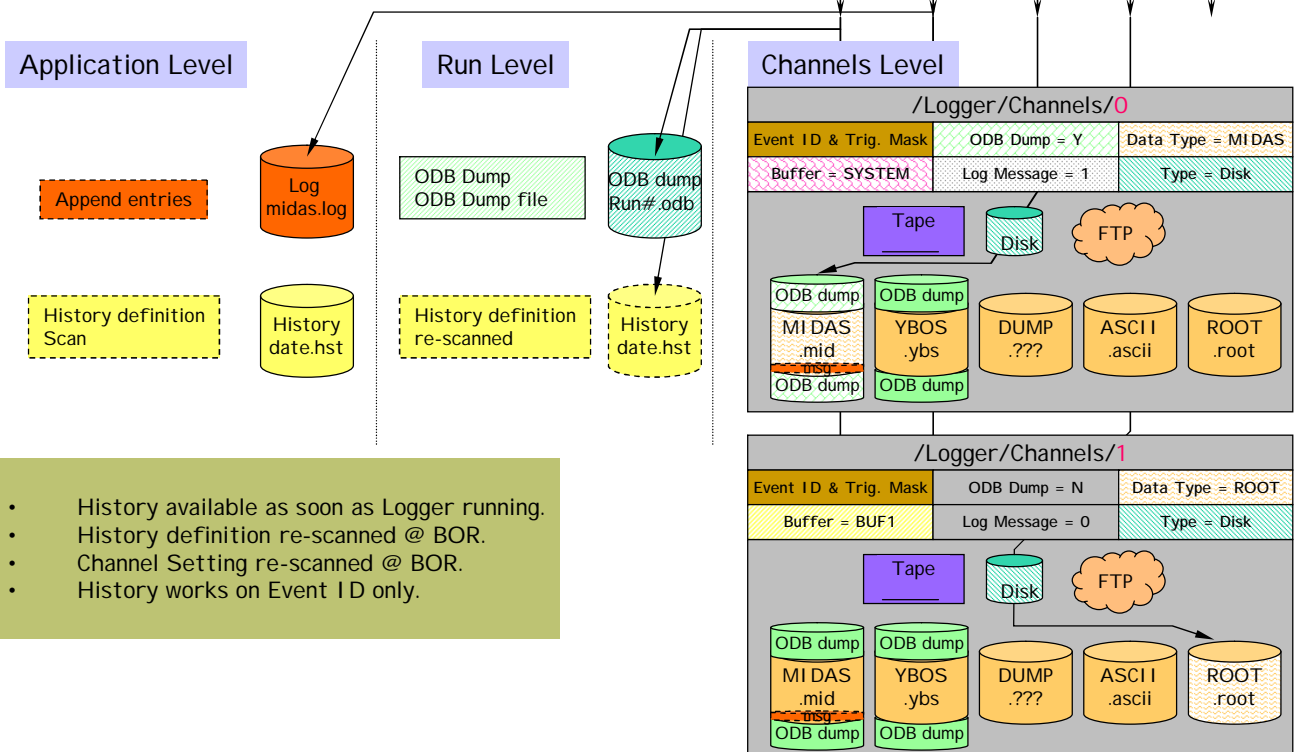
```
...
Level: 98.468 %, Rate: 0.000 MB/sec
Level: 98.468 %, Rate: 1.043 MB/sec
Level: 98.468 %, Rate: 1.099 MB/sec
Level: 98.472 %, Rate: 1.112 MB/sec
Level: 98.155 %, Rate: 1.101 MB/sec
...
```

```
Sun> mdump -e tigress -h midtig01 -y
```

```
Last - Evid: 0000- Mask: 0000- Serial: 0- Time: 0x0- Dsi ze: 0/0x0
Now - Evid: 0001- Mask: 0000- Serial: 3358866- Time: 0x3eb58317- Dsi ze: 19840/0x4d80
Consistency check: \ - 3358882
Last - Evid: 0001- Mask: 0000- Serial: 3358882- Time: 0x3eb58317- Dsi ze: 19840/0x4d80
Now - Evid: 0002- Mask: 0001- Serial: 10811- Time: 0x3eb58318- Dsi ze: 24/0x18
```

mlogger provides 3 main services to the Midas experiment.

1. Centralize system message logging (log file).
2. Multiple Data logging channel (logger/channels/<0>, <1>, ...).
3. History data logging (Frontend defined, /History/links).





```
[ltno01:ltno:Runing]/>ls -lr /Logger/
```

Key name	Type	#Val	Size	Last	Opn	Mode	Value	LTNO
Logger								
Data dir	STRING	1	256	87h	0	RWD	/data1/ltno	
Message file	STRING	1	256	87h	0	RWD	mi das. log	
Auto restart	BOOL	1	4	87h	0	RWD	n	
Write data	BOOL	1	4	87h	0	RWD	y	
ODB Dump	BOOL	1	4	87h	0	RWD	n	
Tape message	BOOL	1	4	87h	0	RWD	y	
ODB Dump File	STRING	1	256	87h	0	RWD	run%05d. odb	
channels								
0	DIR							
Settings								
Active	BOOL	1	4	7m	0	RWD	y	
Type	STRING	1	8	7m	0	RWD	Di sk	
Filename	STRING	1	256	7m	0	RWD	run%05d. mi d	
Format	STRING	1	8	7m	0	RWD	MI DAS	
ODB dump	BOOL	1	4	7m	0	RWD	y	
Log messages	DWORD	1	4	7m	0	RWD	0	
Buffer	STRING	1	32	7m	0	RWD	SYSTEM	
Event ID	INT	1	4	7m	0	RWD	- 1	
Trigger mask	INT	1	4	7m	0	RWD	1	
Event limit	DWORD	1	4	7m	0	RWD	0	
Byte limit	DOUBLE	1	8	7m	0	RWD	0	
Tape capacity	DOUBLE	1	8	7m	0	RWD	0	
Subdir format	STRING	1	32	7m	0	RWD	%Y%m%d	
Current filename	STRING	1	256	7m	0	RWD	20030504/run82104. mi d	
Statistics								
Events written	DOUBLE	1	8	4s	0	RWDE	210	
Bytes written	DOUBLE	1	8	4s	0	RWDE	67795	
Bytes written to	DOUBLE	1	8	4s	0	RWDE	1. 21489e+10	
Files written	INT	1	4	4s	0	RWDE	42616	

Default destination directory

Default system log file name

Global Logger flags

ODB ASCII dump file

Destination type: Disk, Tape, FTP

Data file template:

Run#####.mid

Run#####.ybs

Run#####.root

Data file Format: MIDAS, YBOS, ASCII, DUMP, ROOT

Default Source buffer name

Event ID Request : -1 => ALL

Trigger Mask Request : -1 => ALL

Run control condition based on limits

Subdirectory destination using Coordinated Universal Time. (man date)



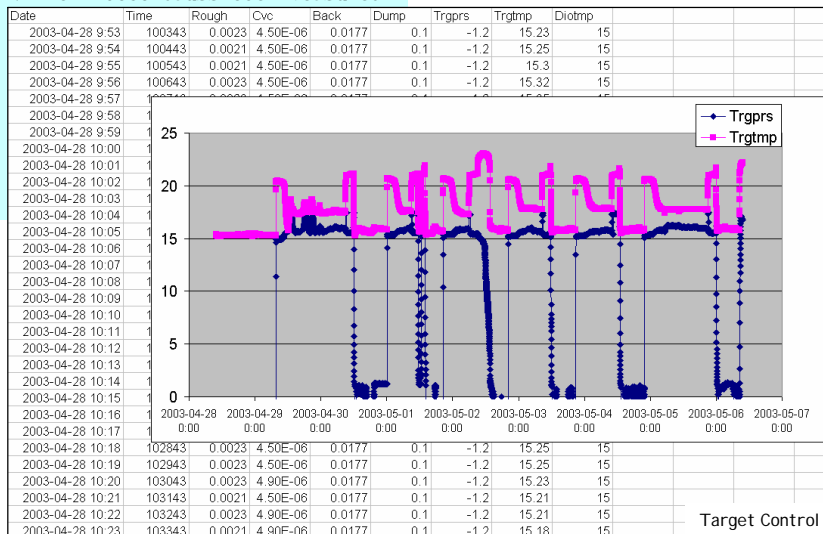
Tool for extracting history data from the save-set files.

- History save-set files produced by the logger.
- Can generate large quantity of data.
- Daily file (031123.hst)
- Easily exported (.xls)

MIDAS experiment "twist"										Fri May 9 22:51:28 2003 Refr:60									
ODB Alarms Status																			
Please select panel: ALL, Trigger rate, Flow1, Flow2, Flow3, Flow4, Flow5, Flow6, Flow7, Flow8, Pres, MFC, GasShack, DAQ, ChTemp1, ChTemp2, ChTemp3, ChTemp4, ChTemp5, load cells, ChTempAll, FBvol, PAtemp1, PAtemp2, Catal Compress (Fsi), ml3Dipole, ml3Quade, sobemps, PCSys, DCSys, magnetref, NMR, PreAmp V, PreAmp I Top, PreAmp I Bottom, HallProbe, SensLenTemp, lasgx, lasgy, lasbx, lasby, CMaxTemps, scalers, cryotemps, ml3shits, lMon PC1-4, lMon PC3-8, lMon PC9-12, lMon DC1-3, lMon DC9-18, lMon DC19-28, lMon DC29-36, lMon DC37-44, VMon DC1-3, VMon DC9-18, VMon DC19-28, VMon DC29-36, VMon DC37-44, pBeam, CryoLevels, B1, B2, NMR, B1, B2 regulator, B1 regulator, B2 regulator																			
temp, ps currents, SolNMR, ramp, temp rence, test, feShip temp, feShip Ex volt, feShip Qx volt, New TWIST																			

mhist -s 021118 -p 021228 -e 10 -t 7200 -v "Bell 5080 Gaussmeter Measured"

```
Nov 18 00:00:34 2002 -146.8
Nov 18 02:02:38 2002 -146.5
Nov 18 04:04:43 2002 -146.1
Nov 18 06:06:47 2002 -146.1
Nov 18 08:08:50 2002 -196
Nov 18 10:10:47 2002 -196
Nov 18 12:11:48 2002 -195.6
Nov 18 14:13:27 2002 -195.2
...
```



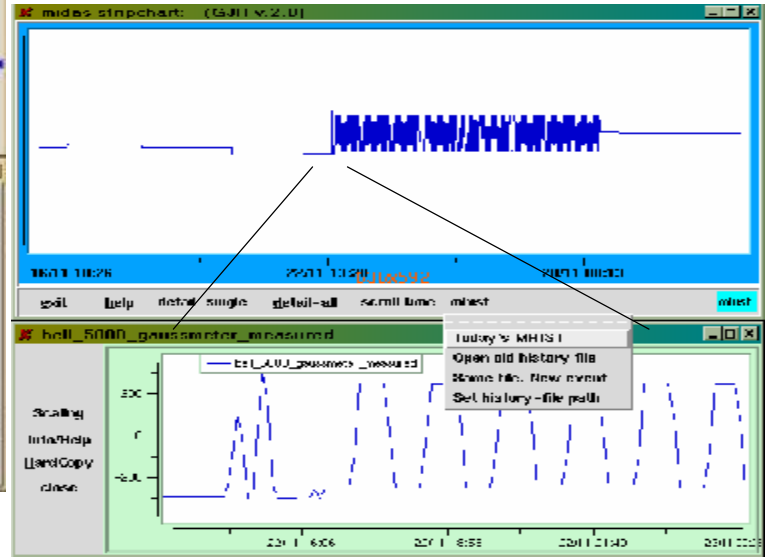
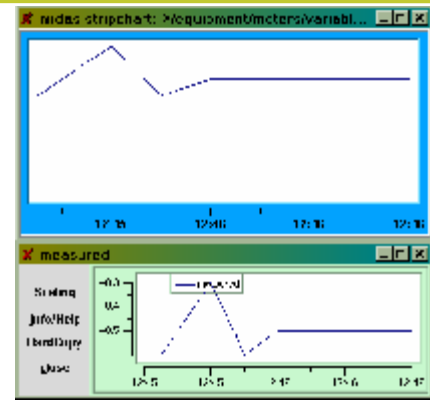
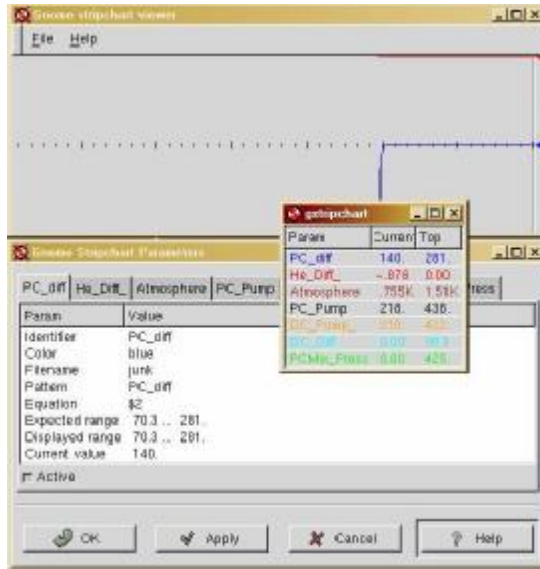
ODB data formatter for stripchart utility. Alternative history display based on the Gnome stripchart. Customized version stripchart.tcl for online history data and history files.

```
mchart -e ltno -c -f Gauss -q /equipment/meters/variables
```

→ Files: Gauss.conf (configuration), Gauss (data)

```
mchart -e ltno -f Gauss -gh
```

→ Update file Gauss → stripchart can read the update Gauss file



Midas Short Course - Real Time 2003 - Montreal - Part II

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Client interface to speech synthesizer program. Initially fun application to have, lately very useful tool when counting room gets too crowded.

Used for:

- Triggered Odbedit msg or chat command.
- Triggered by function call cm_msg(MUSER/MTALK,...).

```
Sun> odb -e chaos -h koslx0
[koslx0: chaos: Stopped]/>chat
Your name is Pierre
Exit chat mode with empty line.
> Is the chamber fixed yet?
09:27:55 [Pierre] Is the chamber fixed yet?
09:28:42 [Greg] Well, we're waiting for you!
```

DEMO

```
Sun> odb -e chaos -h koslx0
[koslx0: chaos: Stopped]/>msg "It's too late, I'm going home"
```

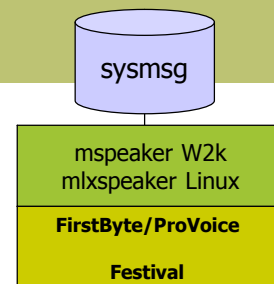
```
cm_msg(MTALK, "my_prg", "Spoken message");
Example: mlogger.c

...
if (status != SS_SUCCESS && !stop_requested) {
    if (status == SS_IO_ERROR)
        cm_msg(MTALK, "log_write", "Physical I/O error on %s, stopping run", log_chn->path);
    else
        cm_msg(MTALK, "log_write", "Error writing to %s, stopping run", log_chn->path);
    stop_requested = TRUE;
    cm_transition(TR_STOP, 0, NULL, 0, ASYNC, FALSE);
    stop_requested = FALSE;
}
```

Logger code

```
#!/bin/tcsh
# Script to restart all DAQ processes running on machine TWIST ...
# The Midas text to audio processor
odb -c scl -e Sxpt | grep --silent -i speaker
if ( "$?" != "0" ) then
    echo "Starting mlxspeaker as daemon"
    mlxspeaker -e Sxpt -D \
        -u 'play --volume=0.3 /home/twistonl/bin/wav/bleep8.wav' \
        -t 'play --volume=0.4 /usr/share/sounds/KDE_Dialog_Appear.wav' -s 5&
endif
```

TWIST



Sat> mlxspeaker -D

Midas Short Course - Real Time 2003 - Montreal - Part II

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Interactive program for access to CAMAC system, essential for debugging.

- Repeat, Delay, 16/24bit.
- Submit Job.
- CNAF calls
- Midas CAMAC Standard (mcstd.h)

```
E823 [/home/e823/online]>mcnaf
mCNAF> [BOCON01A02F00 [0/0x000000 Q0X0] R1WOM24] :c1n13a0f0
mCNAF> [BOC1N13A00F00 [1/0x000001 Q1X1] R1WOM24] :n19
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R1WOM24] :
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R1WOM24] :r3 ← Repeat
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R3WOM24] :g ← Go
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R3WOM24] < 001
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R3WOM24] < 002
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R3WOM24] < 003
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R3WOM24] :w100 ← Wait
mCNAF> [BOC1N19A00F00 [252/0x0000fc Q1X1] R3WOM24] :j ← Job
```

mCNAF> Job file name [cnaf.cnf]:rewind

```
mCNAF> [BOC1N30A09F24 [252/0x0000fc Q1X1] R3W100M24]
mCNAF> [BOC1N13A00F09 [0/0x000000 Q1X1] R3W100M24]
mCNAF> [BOC1N13A00F16 [6/0x000006 Q1X1] R3W100M24]
```

Address	Data Dec/Hex	QX	Wait	Repeat	Mode

Hardware supported:

- KCS2926, KCS2927 (dio/lx)
- DSP004(dio)
- HYT1331(dio)/w2k/lx
- WI ENER-CC32(w2k/lx)
- JORWAY73A(lx)
- CES8210(vxWorks)

```
E823 [/home/e823/online]>more rewind
c1n30a9f24
n13f9a0
f16x006
f16x806
f16x006
f16x000
x0
x0
f9a0
f16a1d0
d10000
d1000000
d10110000
d10210000
xxxxfff
f9a0
f26a1
a2
```

E823

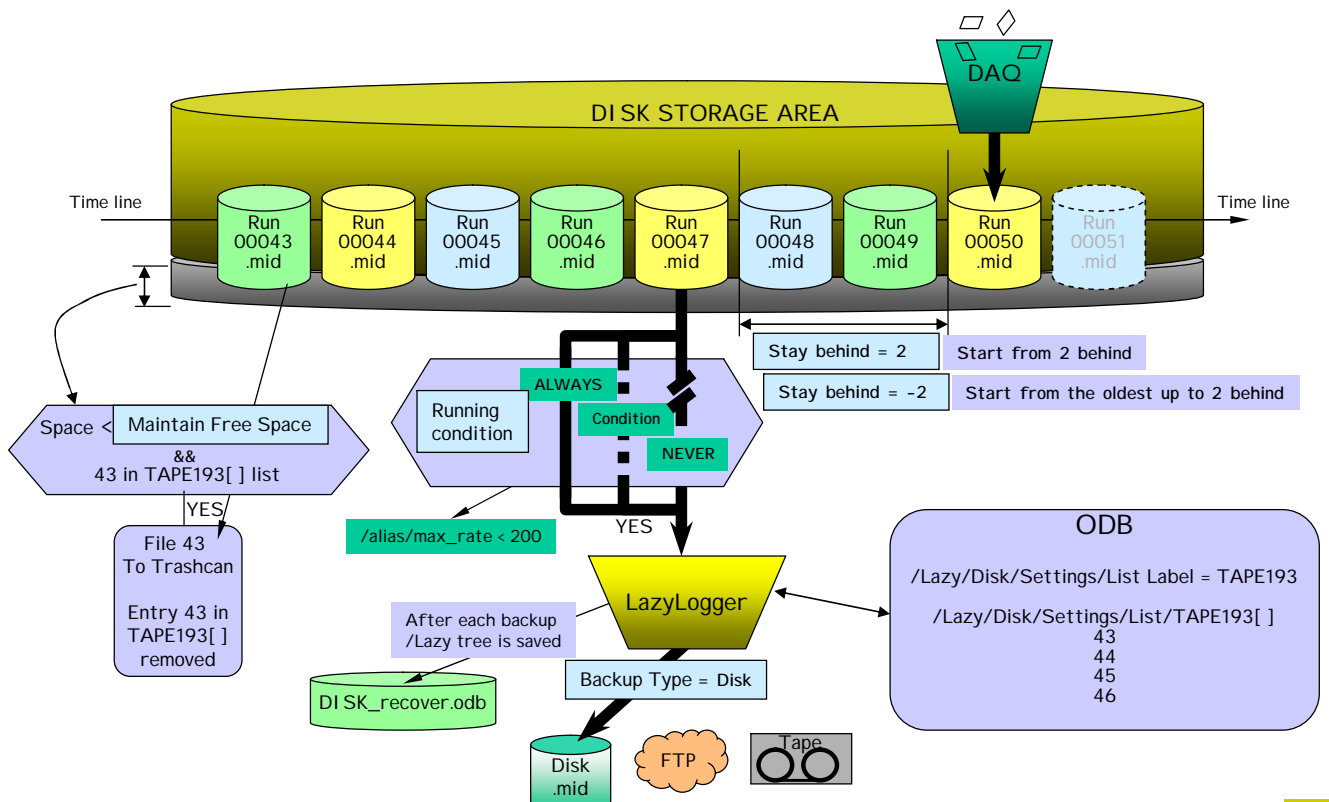
/midas/utls/makefile.mcnaf: Build mcnaf, miocnaf, (mdrvcnaf)

```
Sun> dio miocnaf ← mcnaf with Direct IO access without Frontend
Sun> mdrvcnaf ← mcnaf with proper driver without Frontend (lxcamac)
Sun> mcnaf ← mcnaf through frontend (RPC)
```

Application meant to decouple the acquisition from the actual streamer data storing task.

Fed up with 8mm tapes.

The tape handling of the streamer device requires(ed) lengthy initialization operation [8mm Tape] which impacts on the experimenter patience and acquisition live time in particular for short run time.





```
[/Lazy/Tape/Settings]
Maintain free space(%) = INT : 15
Stay behind = INT : -1
Alarm Class = STRING : [32] Warning
Running condition = STRING : [128] ALWAYS
Data dir = STRING : [256] /data_onl/current
Data format = STRING : [8] YBOS
Filename format = STRING : [128] run%05d.ybs
Backup type = STRING : [8] Tape
Execute after rewind = STRING : [64] /home/twiststn/online/bin/ask_for_tape.sh
Path = STRING : [128] /dev/nst0
Capacity (Bytes) = FLOAT : 5e+10
List label = STRING : [128] tw0166
Execute before writing file = STRING : [64] /home/twiststn/online/bin/lazy_prewrite.csh
Execute after writing file = STRING : [64] /home/twiststn/online/bin/rundb_addrun.pl
Modulo.Position = STRING : [8] 1.0
Tape Data Append = BOOL : y
```

Keep the drive with a minimum of %GB

Stay behind... leave always 1 full run on the disk between the lazy run and the current run.

Data Format: MIDAS, YBOS

Data source directory

Destination type : Tape, Disk, FTP

Label of the backup tape

For multiple lazylogger channel on the same data source (3.1, 3.2, 3.3)

```
[/Lazy/Tape/Statistics]
Backup file = STRING : [128] run06746.ybs
File size [Bytes] = FLOAT : 2.00347e+09
KBytes copied = FLOAT : 2.00347e+09
Total Bytes copied = FLOAT : 2.98002e+10
Copy progress [%] = FLOAT : 100
Copy Rate [bytes per s] = FLOAT : 1.73682e+06
Backup status [%] = FLOAT : 99.334
Number of Files = INT : 21
Current Lazy run = INT : 6746
```

Once a run has been backed up, the run number appear in the List tree. It will remain in the list until the physical source file is removed from the source directory (Space maintenance).

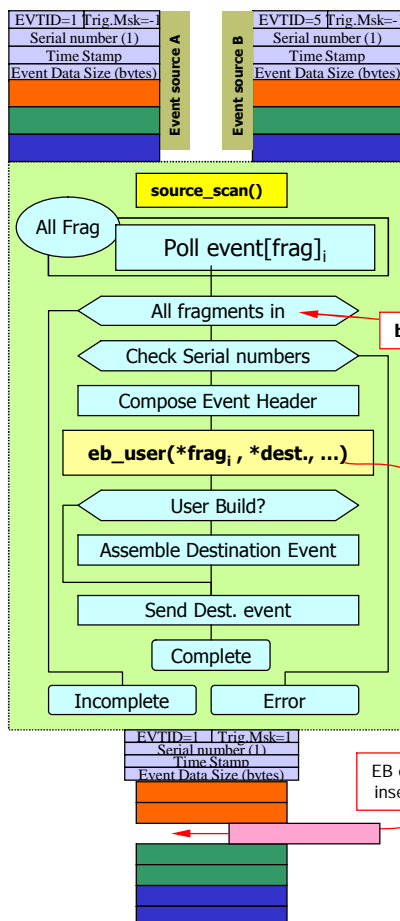
```
[/Lazy/Tape/List]
tw0153 = INT : 9108
tw0154 = INT[71] :
[0] 9109
[1] 9110
[2] 9111
[3] 9112
[4] 9113
[5] 9114
```

TWIST

Midas.log

```
Mon May 20 15:09:13 2002 [Lazy_Tape] tw0058[1] (cp:125.5s) /dev/nst0/run04390.ybs 530.156MB file NEW (total 16966 blocks)
Mon May 20 15:09:24 2002 [Lazy_Tape] Starting lazy job on run04391.ybs
Mon May 20 15:16:02 2002 [Lazy_Tape] tw0058[2] (cp:397.8s) /dev/nst0/run04391.ybs 1908.438MB file NEW (total 78037 blocks)
Mon May 20 15:16:12 2002 [Lazy_Tape] Starting lazy job on run04392.ybs
```

TWIST



eb_begin_of_run(int run, char *UserField, char *error)

eb_end_of_run(int run, char *error)

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

TWIST (poster RT-122)
On 2xPII 1-1.2GHz/1GB - 2xIDE100
ETH0 - FE-source1 12% 3.5MB/s
ETH1 - FE-source2 12% 3.5MB/s
Mevb 15%
Mlogger 20% 7.0MB/s

ODB structure

[midtwist:twist:Stopped]/EBuilders -l-r										TWIST	
Key name		Type	#Val	Size	Last	Opn	Mode	Value			

EBuilders		DIR									
Settings		DIR									
Setting parent 1	Event ID	WORD	1	2	>99d	0	RWD	1			
	Trigger mask	WORD	1	2	>99d	0	RWD	1			
	Buffer	STRING	1	32	>99d	0	RWD	SYSTEM			
	Format	STRING	1	32	>99d	0	RWD	YBOS			
	User Field	STRING	1	64	>99d	0	RWD	100			
	Event_mask	WORD	1	4	>99d	0	RWD	3			
User_build	BOOL	1	4	>99d	0	RWD	n				

hostname		STRING	1	64	14h	0	RWD	midtwist			
Statistics		DIR									
Events sent		DOUBLE	1	8	9h	0	RWD	0			
Events per sec.		DOUBLE	1	8	9h	0	RWD	0			
kBytes per sec.		DOUBLE	1	8	9h	0	RWD	0			
Channels		DIR									
Frag1		DIR									
Settings		DIR									
Setting parent 1	Event ID	WORD	1	2	>99d	0	RWD	1			
	Trigger mask	WORD	1	2	>99d	0	RWD	65535			
	Buffer	STRING	1	32	>99d	0	RWD	YBUF1			
	Format	STRING	1	32	>99d	0	RWD	YBOS			
	Event_mask	DWORD	1	4	>99d	0	RWD	1			
	Statistics	DIR									
Events sent		DOUBLE	1	8	87h	0	RWD	227392			
Events per sec.		DOUBLE	1	8	87h	0	RWD	224696			
kBytes per sec.		DOUBLE	1	8	87h	0	RWD	0			
Frag2		DIR									
Settings		DIR									
Setting parent 2	Event ID	WORD	1	2	>99d	0	RWD	5			
	Trigger mask	WORD	1	2	>99d	0	RWD	65535			
	Buffer	STRING	1	32	>99d	0	RWD	YBUF2			
	Format	STRING	1	32	>99d	0	RWD	YBOS			
	Event_mask	DWORD	1	4	>99d	0	RWD	2			
	Statistics	DIR									
Events sent		DOUBLE	1	8	87h	0	RWD	227393			
Events per sec.		DOUBLE	1	8	87h	0	RWD	224697			
kBytes per sec.		DOUBLE	1	8	87h	0	RWD	0			

bitwise

Event Setting Composition

Event Setting Fragment 1

Event Setting Fragment 2

EB event insertion

Features & Hidden Features

Most of the Midas features become available once the particular application implementing this feature is started. Ex: "mlogger" task will create a default structure in the ODB to match its requirements. The user has the possibility to modify the values and have "immediate reasoned effect".

Some features are not directly related to an application but address more a behavior of the system. In these cases the user has to activate such a "hidden feature" by a particular action (I.e: creation of an entry in ODB).

In the Frontend

Manual Trigger
Large Event
Tiny Event
Deferred transition
Multiple Equipment/
frontend_loop()

Enable manual trigger of the equipment.
Allow large event collection.
Allow small event packing.
Allow transition operation based on condition.

Code examples

In the ODB

Edit on Start
Parameter Comments
Lock when running
Security
History dir
Elog dir

Allow specific run parameters entries at BOR.
Specify comment for Run start with Web browser
Allow ODB variables write protect during run.
Control Midas experiment access (ODB, tasks).
Specify History dir.
Specify Elog dir.

In the Web Browser

Alias
Script
Custom

Shortcut hyperlink.
Script hyperlink.
Custom Midas web page.

Midas features driven by the experiment requirements I

μSR experiment

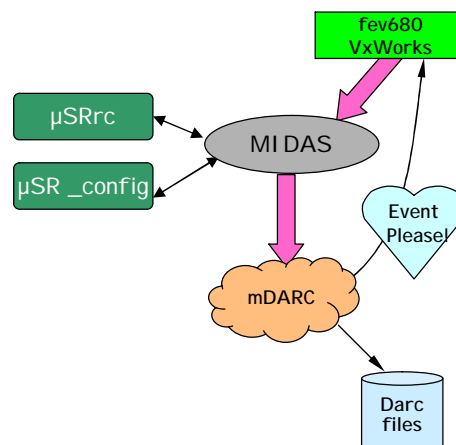
- Uses special VME TDC (V680) hardware.
- Build large size internal histograms in the Frontend.
- Requires flexible re-configuration between runs.
- Simple interface to the μSR standard data format.
- Event request on demand (mdarc).

```

----- Event # 14 -----
Evi d: 0003- Mask: 0000- Serial : 1327- Time: 0x3ebbdd33- Dsi ze: 80/0x50
#banks: 1 Bank l ist: -SCLR-
----- Event # 15 -----
Evi d: 0003- Mask: 0000- Serial : 1328- Time: 0x3ebbdd38- Dsi ze: 80/0x50
#banks: 1 Bank l ist: -SCLR-
----- Event # 16 -----
Evi d: 0002- Mask: 0000- Serial : 43- Time: 0x3ebbdd39- Dsi ze: 4096068/0x3e8044
#banks: 5 Bank l ist: -HI 00HI 01HI 02HI 03HI 04-
----- Event # 17 -----
Evi d: 0003- Mask: 0000- Serial : 1329- Time: 0x3ebbdd41- Dsi ze: 80/0x50
#banks: 1 Bank l ist: -SCLR-
----- Event # 18 -----
Evi d: 0003- Mask: 0000- Serial : 1330- Time: 0x3ebbdd47- Dsi ze: 80/0x50
#banks: 1 Bank l ist: -SCLR-
    
```

μSR

MIDAS experiment "musr"					Fri May 9 09:57:01 2003 Refr:60				
Stop	Pause	ODB	CNAF	Messages	ELog	Alarms	Programs	History	Config
Help									
Real	Test	Toggle	Kill	Display	Save				
Trigger Histo event									
mdarc flags fix mode v680 output									
Run #5144		Running		Alarm On		Restart No		Logger not running	
Start: Fri May 9 07:50:55 2003						Running time: 2h06m06s			
Equipment		FE Node		Events	Event rate[/s]	Data rate[kB/s]		Analyzed	
MUSR TD acq		fev680@m15hmvw		0	0.0	0.0		0.0%	
Scaler		fev680@m15hmvw		1358	0.0	0.0		0.0%	
Histo		fev680@m15hmvw		43	0.0	0.0		0.0%	
Diag		fev680@m15hmvw		1357	0.0	0.0		0.0%	
Rscal		fev680@m15hmvw		1372	0.0	0.0		0.0%	
Channel				Active	Events	MB written		GB total	
0				No Logger	0	0.000		0.000	
09:54:18 [Mdar] *** data saved in file /data/m15/2003/005144.msr_v40 at Fri May 9 09:54:18 2003 ***									
fev680 [m15hmvw]				musr_config [midm15.triumf.ca]			Mdar [midm15.triumf.ca]		
musrrc [midm15.triumf.ca]				mhttpd [midm15.triumf.ca]			mdump [ssdaq01]		



Frontend: Huge Event

Transmit event larger than default frontend buffer size.

File : hugefe.c

Comment: Event sent individually. No buffering.

Booked 5MB used 4MB

Result

```
C:\>mdump -f x
-1.9.1 -- Enter <!> to Exit ----- Midas Dump ---
----- Event# 1 -----
Evid: 0003- Mask: 0000- Serial: 17- Time: 0x3e9b89c1- Dsi ze: 40
#banks: 1 - Bank list: - BIGG-

Bank: BIGG Length: 4000000(I*1)/1000000(I*4)/1000000(Type)
1-> 0x00000000 0x00000000 0x00000000 0x00000000 0x000000
9-> 0x00000000 0x00000000 0x00000000 0x00000000 0x000000
17-> 0x00000000 0x00000000 0x00000000 0x00000000 0x000000
25-> 0x00000000 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcd
33-> 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcd
...
999937-> 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcd
999945-> 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd
999953-> 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd
999961-> 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd
999969-> 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd 0xcdcdcdcd
999977-> 0xffffffff 0xffffffff 0xffffffff 0xffffffff 0xffffffff
999985-> 0xffffffff 0xffffffff 0xffffffff 0xffffffff 0xffffffff
999993-> 0xffffffff 0xffffffff 0xffffffff 0xffffffff 0xffffffff
```

```
/* maximum event size for fragmented events (EQ_FRAGMENTED) */
INT max_event_size_frag = 5*1024*1024;

{ "Huge",
  2, 0,
  "SYSTEM",
  EQ_PERIODIC | EQ_FRAGMENTED,
  0,
  "MI DAS",
  TRUE,
  RO_RUNNING |
  RO_TRANSITIONS |
  RO_ODB,
  10000,
  0,
  0,
  0,
  read_huge_event,
  },
```

Equipment structure

INT read_huge_event(char *pevent, INT off)

readout function

```
{
  DWORD *pddata;

  /* init bank structure */
  bk_init32(pevent);

  bk_create(pevent, "BIGG", TID_DWORD, &pddata);
  ...
  pddata += 1000000;
  bk_close(pevent, pddata);

  return bk_size(pevent);
}
```

DEMO /µSR

Frontend: Manual Trigger

Enable "Manual Trigger" button in the Web browser Midas page. Requested by user to force special computation/statistics done in an equipment.

File : mantrigfe.c

```
{ "mantrig",
  2, 0,
  "SYSTEM",
  EQ_PERIODIC |
  EQ_MANUAL_TRIGGER,
  0,
  "MI DAS",
  TRUE,
  RO_RUNNING |
  RO_TRANSITIONS |
  RO_ODB,
  10000,
  0,
  0,
  0,
  read_mantrig_event,
  },
```

Equipment structure

DEMO/µSR

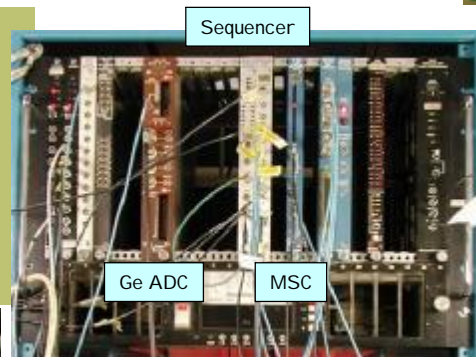
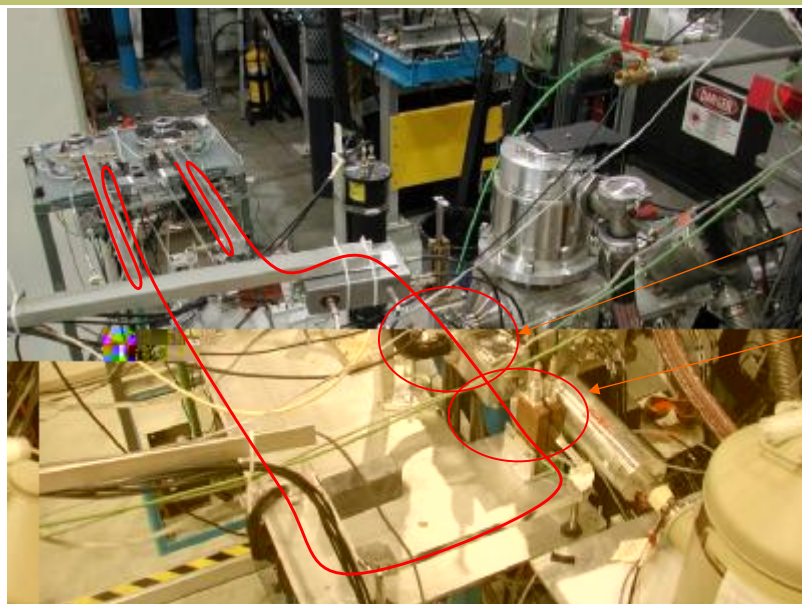
```
...
status = cm_connect_client(fe_name, &hconn);
if (status != RPC_SUCCESS) {
  ...
}
else {
  status = rpc_client_call(hconn, RPC_MANUAL_TRIGGER, event_id);
  if (status != CM_SUCCESS) {
    ...
    cm_disconnect_client(hconn, FALSE);
  }
}
...
mhttpd /µSR
```

MIDAS experiment "midas"					Mon Apr 14 21:43:40 2003		Refr:60		
Start	ODB	CNAF	Messages	ELog	Alarms	Programs	History	Config	Help
Trigger mantrig event								Result	
Run #17	Stopped		Alarms: Off		Restart: No		Logger not running		
Start: Mon Apr 14 21:42:06 2003					Stop: Mon Apr 14 21:43:18 2003				
Equipment	FE Node		Events	Event rate[s]		Data rate[kB/s]		Analyzed	
mantrig	mantrigfe@pierre2		5	0.0		0.0		0.0%	
Channel			Active	Events		MB written		GB total	
21:43:19 [ODBEEdit] Run #17 stopped									
ODBEEdit [pierre2]			mantrigfe [pierre2]			mhttpd [pierre2]			

Midas features driven by the experiment requirements II

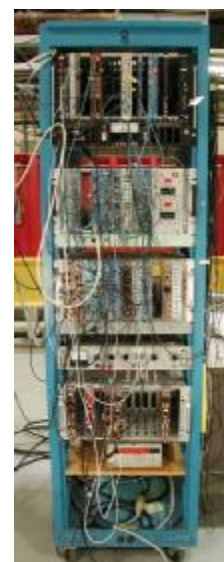
GPS experiments (Precise Half-Life Measurements).

- Uses dedicated radioactive ions tape transport.
- Needs tape mechanism control synchronized with the DAQ.
- Measurement cycle can be long, ensure data validity over the full run.
- Tape movement constrain (keep it moving!).
- Secondary equipment for Ge LAM data collection.
- Synchronize LifeTime cycle with primary beam (EPI CS).



I on implantation

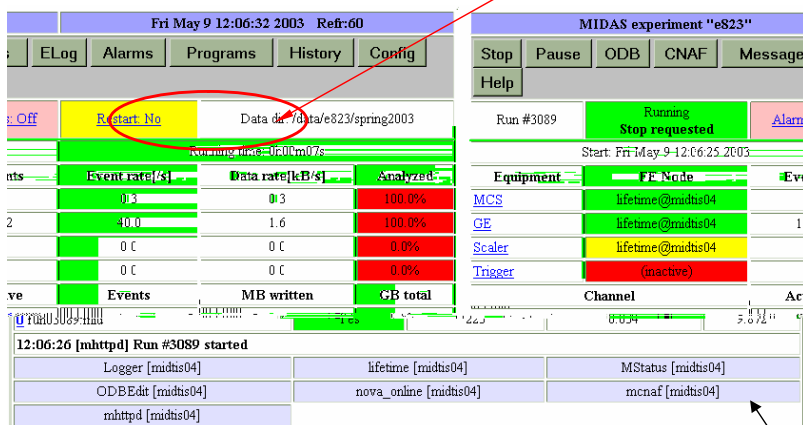
4pi Detector



Frontend: Deferred transition I

Postpone transition until user condition satisfied.

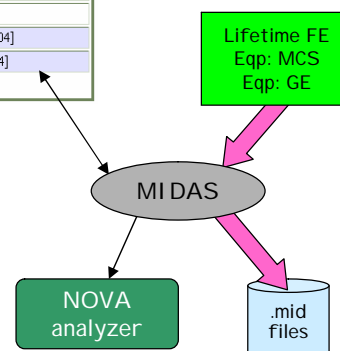
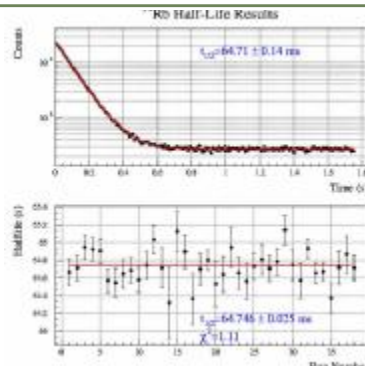
- TR_STOP : Wait for final cycle, start Bg tape move.
- TR_START: Initialize sequencer, stop Bg tape move.



- BOR:
- Move Tape.
 - Initialize sequence.

- Acquisition:
- Wait for implantation
 - Move Tape to 4pi counter
 - Start decay measurement
 - Collect decay data (MSC)
 - Move Tape
 - ...

- Frontend_loop()
- Keep Tape moving



Frontend: Deferred transition II

File : deferredfe.c

Comments:

- Only for Polled Equipment.
- Register for specific Transition (START, PAUSE, RESUME, STOP)

```
INT frontend_init()
{
    // register for deferred transition
    cm_register_deferred_transition(TR_STOP, wait_end_cycle);
    cm_register_deferred_transition(TR_PAUSE, wait_end_cycle);
    ...
}
```

Initialization function

```
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
```

Result

```
Event ID:2 - Event#: 1
Event ID:2 - Event#: 2
Event ID:2 - Event#: 3
Transition requested...
Transition ignored, Event ID:2 - Event#: 4
Transition ignored, Event ID:2 - Event#: 5
Transition ignored, Event ID:2 - Event#: 6
End of cycle... perform transition
Event ID:2 - Event#: 7
Run #21 stopped
```

Stop or pause requested

```
BOOL transition_PS_requested = FALSE;
BOOL end_of_cycle = FALSE;
```

Declaration section

```
//-- Deferred transition callback
BOOL wait_end_cycle(int transition, BOOL first)
{
    if (first) {
        // Get there as soon as transition is requested
        transition_PS_requested = TRUE;
        printf("Transition requested...\n");
        // Defer the transition now
        return FALSE;
    }
}
```

Callback function

```
// Check user flag
if (end_of_cycle) {
    // User flag set, ready to perform deferred transition now
    transition_PS_requested = FALSE;
    end_of_cycle = FALSE;
    return TRUE;
}
else {
    return FALSE; // User not ready for transition, defers it...
}
```

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

readout function

```
{
    DWORD *pdata;
    bk_init(pevent);
    bk_create(pevent, "DEFR", TID_DWORD, &pdata);
    ...
    bk_close(pevent, pdata);

    if (transition_PS_requested) {
        // transition acknowledged, but...
        // carry on until hardware condition satisfied
        // ...
        if (pseudo_delay++ < 3) {
            // Ignore transition
            printf("Transition ignored, ");
        }
        else {
            // Time to do transition
            printf("End of cycle... perform transition\n");
            end_of_mcs_cycle = TRUE;
        }
    }
    printf("Event ID:%d - Event#: %d\n", EVENT_ID(pevent), SERIAL_NUMBER(pevent));
    return bk_size(pevent);
}
```

DEMO/E823

Midas Short Course - Real Time 2003 - Montreal - Part II

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Frontend: Tiny Event

Transmit packed event under one bank. When the event data size is comparable to the header, packing multiple frontend events under a single bank improves CPU and disk usage. Requires proper sub-event handling at the analyzer level.

File : tinyfe.c

Comments: Only for Polled event

```
#define NWORDS 3
INT read_tiny_event(char *pevent, INT offset)
{
    static WORD *pdata=NULL;
    static WORD sub_counter=0;
    // Super event structure
    if (offset == 0) { // FIRST event of the Super event
        bk_init(pevent);
        bk_create(pevent, "SUPR", TID_WORD, &pdata);
        sub_counter = 1;
    }
    else if (offset == -1) { // CLOSE Super event
        bk_close(pevent, pdata);
        return bk_size(pevent);
    }
    // READ event
    *pdata++ = 0xB0E;
    *pdata++ = sub_counter++;
    *pdata++ = 0xE0E;

    if (offset == 0) {
        // Compute the proper event length on the FIRST pass
        // 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);
    }
}
```

readout function

$NWORDS * sizeof(WORD) * 10$

Equipment structure

```
{ "Tiny", // equipment name */
  3, 0, // event ID, trigger mask */
  "SYSTEM", // event buffer */
  EQ_POLLED, // equipment type */
  1, // event source */
  "MI DAS", // format */
  TRUE, // enabled */
  RO_RUNNING | // read when running */
  RO_TRANSITIONS, // and on transitions */
  500, // polling 500ms */
  0, // stop run after x events */
  10, // number of sub events */
  0, // log history */
  "", "", "", // readout routine */
}
```

```
C:\>mdump
-1.9.1 - Enter <I> to Exit ----- Mi das Dump ---
----- Event # 1 -----
Evid: 0003- Mask: 0000- Serial: 12652821- Time: 0x3e9b8207- Dsi ze: 80/0x50
#banks: 1 - Bank list: -SUPR-

Bank: SUPR Length: 60(I*1)/15(I*4)/30(Type) Type: Unsigned Integer *2
1-> 0x0b0e 0x0001 0x0e0e 0x0b0e 0x0002 0x0e0e 0x0b0e 0x0003
9-> 0x0e0e 0x0b0e 0x0004 0x0e0e 0x0b0e 0x0005 0x0e0e 0x0b0e
17-> 0x0006 0x0e0e 0x0b0e 0x0007 0x0e0e 0x0b0e 0x0008 0x0e0e
25-> 0x0b0e 0x0009 0x0e0e 0x0b0e 0x000a 0x0e0e
```

Result

DEMO/E823

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Frontend: multiple polling equipment, frontend_loop()

```

/*-- Equipment list -----*/
EQUIPMENT equipment[] = {

    { "MCS", /* equipment name */
      1, 0x0001, /* event ID, trigger mask */
      "SYSTEM", /* event buffer */
      EQ_POLLED, /* equipment type */
      LAM_SOURCE(CRATE, LAM_STATION(JW_N)), /* event source */
      "MI DAS", /* format */
      TRUE, /* enabled */
      RO_RUNNING, /* read only when running */
      5, /* poll for 5ms */
      0, /* stop run after this event limit */
      0, /* number of sub event */
      0, /* don't log history */
      "", "", "",
      read_mcs_event, /* readout routine */
    },

    { "GE", /* equipment name */
      2, 0x0002, /* event ID, trigger mask */
      "SYSTEM", /* event buffer */
      EQ_POLLED, /* equipment type */
      LAM_SOURCE(CRATE, LAM_STATION(AD_N)), /* event source */
      "MI DAS", /* format */
      TRUE, /* enabled */
      RO_RUNNING, /* read only when running */
      100, /* poll for 100ms */
      0, /* stop run after this event limit */
      0, /* number of sub event */
      0, /* don't log history */
      "", "", "",
      read_ge_event, /* readout routine */
    },

    { "Scaler", /* equipment name */
      4, 0x4, /* event ID, trigger mask */
      "SYSTEM", /* event buffer */
      EQ_PERIODIC, /* equipment type */
      0, /* event source */
      "MI DAS", /* format */
      FALSE, /* disabled */
      RO_RUNNING |
      RO_TRANSITIONS |
      RO_ODB, /* read when running and on transitions */
      10000, /* and update ODB */
      0, /* read every 10 sec */
      0, /* stop run after this event limit */
      0, /* number of sub event */
      0, /* log history */
      "", "", "",
      read_scaler_event, /* readout routine */
    },
    { "" }
};

```

E823

```

char *frontend_name = "lifetime";
char *frontend_file_name = _FILE_;

/* frontend_loop is called periodically if this var. is TRUE */
BOOL frontend_call_loop = TRUE;
/* a frontend status page is displayed with this freq. in ms */
INT display_period = 3000;

/* globals */
BOOL end_of_mcs_cycle = FALSE;
BOOL transition_PS_requested = FALSE;

/*-- Function declarations -----*/

INT read_mcs_event(char *pevent, INT off);
INT read_ge_event(char *pevent, INT off);
INT read_scaler_event(char *pevent, INT off);
INT channel_cycle_loop(void);
INT time_cycle_loop(void);
INT sequencer(INT action);
INT re_arm_ge(void);
INT re_arm_cycle(void);

```

E823

```

/*-- Frontend Loop -----*/
INT frontend_loop()
{
    DWORD cur_time;
    /* if frontend_call_loop is true, this routine gets called
    when the frontend is idle or once between every event */
    /* prepare sequencer */
    static char bars[] = "|/-\\\";
    static int i_bar=0;

    if ((i_bar++ % 10) == 0) {
        printf("%c\r", bars[i_bar++ % 4]);
        fflush(stdout);
    }

    if ((run_state == STATE_PAUSED) && (pause_time != 0)) {
        cur_time = ss_time();
        if ((cur_time - pause_time) > (INT) seq.tape.delay) {
            /* ready for moving tape */
            if (sequencer(SEQ_MOVE_TAPE) == SUCCESS) {
                pause_time = cur_time;
                return SUCCESS;
            }
        }
        return FE_ERR_HW;
    }
}

```

E823

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Ease the experiment control ODB/Web

Midas Web Run Control

The screenshot displays the Midas Web Run Control interface. It features several panels:

- Equipment panels:** A table listing equipment (e.g., MCS, GE, Scaler) with columns for status, event ID, trigger mask, and readout routine.
- History panel:** A section for viewing historical data and events.
- Control panels:** A section for managing the experiment, including buttons for 'Execute', 'Status', and 'Help'.
- SC panels:** A section for setting up the experiment, including fields for 'Repeat', 'Repeat delay', 'Data increment', and 'A increment'.

Equipment panels

If ODB is Write protected

Please do not press the button until the error is cleared

Entire information is (can be) available in ODB.
Develop/extend single interface for control & monitoring.

Implement hidden features to no clutter the already busy display.

SC panels

History panel

The screenshot shows the Midas experiment 'silicon' control panel. It includes a table with columns for 'N', 'A', 'F', and 'Data'. The table contains numerical values for these parameters. Below the table, there are fields for 'Repeat', 'Repeat delay [ms]', 'Data increment', and 'A increment'. There are also buttons for 'Set inhibit' and 'Clear inhibit'.

Camac panel

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OdbEdit: /Experiment/Edit on Start (hidden)

Provides run parameters entries at "Begin of run" (BOR).

Comment: Will be available only in the "Run Start" page of the Web Browser Midas page.

```
[local:bnmr1:S]/>cd "Experiment/Edit on start/"
[local:bnmr1:S]Edit on start>ls -l
Key name      Type      #Val  Size  Last Opn Mode Value
-----
run_title     STRING    1      88    5m  0  RWD  NbSe2 H=-112G 40K 55-85 KHz 300Hz
AFG=10mV
experiment_number DWORD     1       4    5m  0  RWD  815
experimenter  STRING    1      32    5m  0  RWD  wam
sample        STRING    1      11    5m  0  RWD  NbSe2
orientation   STRING    1      11    5m  0  RWD  c-axis
temperature   STRING    1      11    5m  0  RWD  40K
field         STRING    1      11    5m  0  RWD  -112G
Write Data    LINK      1      19   >99d 0  RWD  /Logger/Write data
Edit run number  BOOL      1       4    6h  0  RWD  n
```

Run started from ODB

Run started from the Web Browser

Not editable field

```
[local:bnmr1:S]Edit on start>start
run_title : NbSe2 H=-112G 40K 55-85 KHz 300Hz
AFG=10mV
experiment_number : 815
experimenter : wam
sample : NbSe2
orientation : c-axis
temperature : 40K
field : -112G
Write Data : y
Run number [40066]:
```

Result

MIDAS experiment "bnmr1"		Mon Apr 14 22:58:07 2003
Start new run		
Run number	40066	
run_title	NbSe2 H=-112G 40K 55-85 KHz 300Hz AFG=10mV	
experiment_number	815	
experimenter	wam	
sample	NbSe2	
orientation	c-axis	
temperature	40K	
field	-112G	
Write Data	y	
Start Cancel		Result

OdbEdit: /Experiment/Parameter Comments (hidden)

Provides additional run parameters comments for the Web browser form.
If parameters are not clear enough!

Comment: Will be only available in the "Run Start" page of the Web Browser Midas page.

```
[local:bnmr1:S]/Experiment>cd "Parameter Comments/"
[local:bnmr1:S]Parameter Comments>ls -l
Key name      Type      #Val  Size  Last Opn Mode Value
-----
experimenter  STRING    1      35    1m  0  RWD  <H2><b> Some useful name!</b></H2>
field         STRING    1      32    1m  0  RWD  <i>Not in Tesla!</i> DEMO / Bnmr
```

ODB structure

MIDAS experiment "bnmr1"		Mon Apr 14 23:05:32 2003
Start new run		
Run number	40066	
run_title	NbSe2 H=-112G 40K 55-85 KHz 300Hz AFG=10mV	
experiment_number	815	
experimenter	wam	
Some useful name!		
sample	NbSe2	
orientation	c-axis	
temperature	40K	
field Not in Tesla!	-112G	
Write Data	y	
Start Cancel		Result

OdbEdit: /Experiment/Lock when running (hidden)

```
[local:bnmr1:S]/>cd "Experiment/Lock when running/"
[local:bnmr1:S]Lock when running>ls -l
Key name      Type  #Val  Size  Last Opn Mode Value
-----
dis_rn_check   LINK  1     51    >99d 0    RWD   /Equipment/FIFO_acq/mdarc/disable run number check
Input          LINK  1     35    88h  0    RWD   /Equipment/FIFO_acq/sis mcs/Input/
SIS test mode  LINK  1     43    88h  0    RWD   /Equipment/FIFO_acq/sis mcs/sis test mode/
SIS ref A      LINK  1     65    88h  0    RWD   /Equipment/FIFO_acq/sis mcs/Hardware/Enable SIS ref ch1 scaler A
SIS ref B      LINK  1     65    88h  0    RWD   /Equipment/FIFO_acq/sis mcs/Hardware/Enable SIS ref ch1 scaler B
[local:bnmr1:S]Lock when running>
```

ODB structure

Set Read Only access to declared ODB Variables when run in progress.

Useful to prevent user to change critical run parameters during data taking.

Run Stopped

Starting run

Run in Progress

```
[local:bnmr1:S]Hardware>ls -l
Key name      Type  #Val  Size  Last Opn Mode Value
-----
num cycles     DWORD 1     4     18h  0    RWD   0
Fluor monitor thr  DWORD 1     4     20h  0    RWD   0
Cycle thr (%)   FLOAT 1     4     6h   0    RWD   20
Diagnostic channel num INT    1     4     20h  0    RWD   2
Re-reference    BOOL  1     4     6h   0    RWD   n
num polarization cycles DWORD 1     4     20h  0    RWD   0
polarization switch delay DWORD 1     4     20h  0    RWD   0
Enable SIS ref ch1 scaler A BOOL  1     4     20h  0    RWD   n
Enable SIS ref ch1 scaler B BOOL  1     4     20h  0    RWD   y
Enable helicity flipping BOOL  1     4     8h   0    RWD   y
PPG acq cycle control BOOL  1     4     20h  0    RWD   y
...
[local:bnmr1:S]Hardware>start now
Starting run #40066
23:13:25 [ODBEdit] Run #40066 started
[local:bnmr1:R]Hardware>ls -l
Key name      Type  #Val  Size  Last Opn Mode Value
-----
num cycles     DWORD 1     4     18h  0    RWD   0
Fluor monitor thr  DWORD 1     4     20h  0    RWD   0
Cycle thr (%)   FLOAT 1     4     6h   0    RWD   20
Diagnostic channel num INT    1     4     20h  0    RWD   2
Re-reference    BOOL  1     4     6h   0    RWD   n
num polarization cycles DWORD 1     4     20h  0    RWD   0
polarization switch delay DWORD 1     4     20h  0    RWD   0
Enable SIS ref ch1 scaler A BOOL  1     4     20h  0    RWD   n
Enable SIS ref ch1 scaler B BOOL  1     4     20h  0    RWD   y
Enable helicity flipping BOOL  1     4     8h   0    RWD   y
PPG acq cycle control BOOL  1     4     20h  0    RWD   y
[local:bnmr1:R]Hardware>
[local:bnmr1:R]Hardware>set "Enable SIS ref ch1 scaler A" y
Write access not allowed
Bnmr
```

Result

OdbEdit: /Experiment/Security (hidden)

Provides access control to declared tasks and/or hosts as well as general user access to the experiment and R/W from the Web browser.

Comments:

- By default public Read/Write access to the database.
- "webpasswd" public Write protection
- "passwd" public Read/Write protection.

```
[local:expt:Stopped]/Experiment>cd Security/
[local:expt:Stopped]Security>ls -lr
Key name      Type  #Val  Size  Last Opn Mode Value
-----
Security      DIR
  Allowed hosts  DIR
    host.sample.domain INT  1     4     >99d 0    RWD   0
    host1.triumf.ca INT  1     4     >99d 0    RWD   0
    host2.triumf.ca INT  1     4     >99d 0    RWD   0
    host3vw INT  1     4     >99d 0    RWD   0
    host4vw2 INT  1     4     >99d 0    RWD   0
  Allowed programs  DIR
    mstat INT  1     4     >99d 0    RWD   0
  Password STRING 1    32    >99d 0    RWD   moj nNsGpGtz4
  Web Password STRING 1    32    >99d 0    RWD   mnm6Ntsn0Rgri
```

ODB structure

Created by ODB> passwd

Invoked by ODB> webpasswd

DEMO/TWIST

OdbEdit: /Logger/Elog dir & /Logger/History dir (hidden)

Provides dedicated path for the storage of the Elog files as well as the History files.

[local:twist:Stopped]/Logger>ls -lr										ODB structure	
Key name	Type	#Val	Size	Last	Opn	Mode	Value				
Logger	DIR										
Data dir	STRING	1	256	22s	0	RWD	/data_onl/current				
Message file	STRING	1	256	22s	0	RWD	mi das.log				
Auto restart	BOOL	1	4	22s	0	RWD	y				
Write data	BOOL	1	4	22s	0	RWD	y				
ODB Dump	BOOL	1	4	22s	0	RWD	y				
ODB Dump File	STRING	1	256	22s	0	RWD	run%05d. odb				
Tape message	BOOL	1	4	22s	0	RWD	y				
Channels	DIR										
0	DIR										
Settings	DIR										
Active	BOOL	1	4	22s	0	RWD	y				
Type	STRING	1	8	22s	0	RWD	Di sk				
Filename	STRING	1	256	22s	0	RWD	run%05d. ybs				
Format	STRING	1	8	22s	0	RWD	YBOS				
ODB dump	BOOL	1	4	22s	0	RWD	n				
Log messages	DWORD	1	4	22s	0	RWD	0				
Buffer	STRING	1	32	22s	0	RWD	SYSTEM				
Event ID	INT	1	4	22s	0	RWD	-1				
Trigger mask	INT	1	4	22s	0	RWD	-1				
Event limit	DWORD	1	4	22s	0	RWD	0				
Byte limit	DOUBLE	1	8	22s	0	RWD	2e+09				
Tape capacity	DOUBLE	1	8	22s	0	RWD	0				
Subdir format	STRING	1	32	22s	0	RWD					
Current filename	STRING	1	256	22s	0	RWD	run13597. ybs				
Statistics	DIR										
...	DIR										
1	DIR										
Settings	DIR										
Active	BOOL	1	4	22s	0	RWD	y				
Type	STRING	1	8	22s	0	RWD	Di sk				
Filename	STRING	1	256	22s	0	RWD	srun%05d. ybs				
Format	STRING	1	8	22s	0	RWD	YBOS				
ODB dump	BOOL	1	4	22s	0	RWD	n				
Log messages	DWORD	1	4	22s	0	RWD	0				
Buffer	STRING	1	32	22s	0	RWD	SYSTEM				
Event ID	INT	1	4	22s	0	RWD	-1				
Trigger mask	INT	1	4	22s	0	RWD	32768				
Event limit	DWORD	1	4	22s	0	RWD	0				
Byte limit	DOUBLE	1	8	22s	0	RWD	2e+09				
Tape capacity	DOUBLE	1	8	22s	0	RWD	0				
Subdir format	STRING	1	32	22s	0	RWD	current_split				
Current filename	STRING	1	256	22s	0	RWD	current_split/srun13597. ybs				
Statistics	DIR										
...	DIR										
History dir	STRING	1	256	22s	0	RWD	/data_onl/el og_hi story				
Elog Dir	STRING	1	23	22s	0	RWD	/data_onl/el og_hi story			TWIST	

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Web Browser: /Alias (hidden)

Provides shortcut to ODB location. Will appear in the Web browser as hyperlink.

Comments:

- /Alias/<shortcut> spawn new frame with the shortcut destination
- /Alias/<shortcut&> replace current frame content with shortcut destination

Result

MIDAS experimen

Start

ODB

CNAF

M

Myscalers FCup RunSummary

Run #8372

Stopped

Start: Sat Apr 12 14:

Equipment

FE Node

gTrigger

dragon@midm

Scaler

dragon@midm

hTrigger

dragon@midm

NewEpics

feepics@isda

ADC Peds

dragon@midm

Channel

Active

Events

MB written

GB total

0 run08371.mid

Disabled

0

0.000

38.217

Mon Apr 14 16:51:22 2003 [mhttpd] Program mhttpd on host isdaq04 started

Logger [isdaq04]

dragon [midmes01]

Analyzer [isdaq04]

Speaker [isdaq04]

feepics [isdaq04]

AllStatus [isdaq04]

mhttpd [isdaq04]

[local:dragon: Stopped]/alias>ls -lr

B HIT <Tab>

ODB structure

Myscalers&

FCup&

[local:dragon: Stopped]/alias>ls -lr

B Hit <Ret>

Key name

Type

#Val

Size

Last

Opn

Mode

Value

alias

DIR

Sums

DIR

Gammas_presented

DOUBLE

1

8

13h

1

RWD

2.75257e+07

Gammas_acquired

DOUBLE

1

8

13h

0

RWD

2.71811e+07

HI_presented

DOUBLE

1

8

13h

0

RWD

6410

HI_acquired

DOUBLE

1

8

13h

0

RWD

6073

Elastics_TSCA

DOUBLE

1

8

13h

0

RWD

12690

Prescaled-TSCA

DOUBLE

1

8

13h

0

RWD

1618

End-Det.-Triggers

DOUBLE

1

8

13h

0

RWD

4793

Gamma-Sum-LED

DOUBLE

1

8

13h

0

RWD

1.24667e+08

Pulsers

DOUBLE

1

8

13h

0

RWD

4319

Beta-monitor

DOUBLE

1

8

13h

0

RWD

0

Elastics-CFD

DOUBLE

1

8

13h

0

RWD

1.69766e+08

Beta-monitor-singles

DOUBLE

1

8

13h

0

RWD

938

FCup&

STRING

1

64

5h

0

RWD

http://midmes01.triumf.ca:8081/HS/Beam?exp=dragon

Dragon

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Web Browser: /Script (hidden)

Provides Web browser shortcut for activation of script.
Will appear in the Web browser as hyperlink after any "alias" links.

Comments:

- /Script/<Button name>/
 <command> Key type (dir). Will appear on the Midas status page.
 <arg or link> Command string.
 <arg or link> Argument passed to the script.
 <arg or link> Argument passed to the script.
- No limits on the number of argument passed to the script.

```
[local:bnmr1:S]/>cd Script/  
[local:bnmr1:S]/Script>ls -lr
```

ODB structure

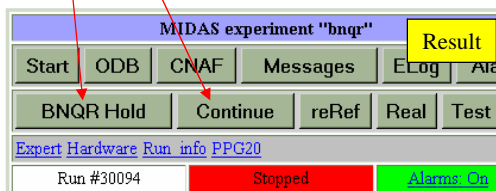
Key name	Type	#Val	Size	Last Opn	Mode	Value

Script	DIR					
BNQR Hold	DIR					
cmd	STRING	1	128	>99d	0	RWD /home/bnqr/online/mdarc/perl/hold.pl
include path	STRING	1	64	>99d	0	RWD /home/bnqr/online/mdarc/perl
Name	STRING	1	32	31s	0	RWD bnqr
hold	BOOL	1	4	6h	0	RWD n
toggle	BOOL	1	4	>99d	0	RWD n
beamline	STRING	1	5	>99d	0	RWD bnqr
Continue	DIR					
cmd	STRING	1	128	>99d	0	RWD /home/bnqr/online/mdarc/perl/continue.pl
include path	STRING	1	64	>99d	0	RWD /home/bnqr/online/mdarc/perl
Name	STRING	1	32	31s	0	RWD bnqr
hold	BOOL	1	4	6h	0	RWD n
beamline	STRING	1	5	>99d	0	RWD bnqr

Perl code

```
ate, trans=$transition\n"; }
```

Bnmr



```
# return  
if ($ppg_mode =~ /^2/i) # match 2 at beginning of string (e.g. 2a)  
{  
    print FOUT "Run in progress. Use Toggle button to change run type\n";  
    ($status)=odb_cmd ("msg", "SMINFO", "", "Sname", "WARNING - run is in progress.  
    Use toggle button to change run type" );  
    unless ($status) { print FOUT "Sname: Failure status after odb_cmd (msg)\n"; }  
    die " Run is in progress. Use Toggle button to change the run type\n";  
}  
else # Type 1  
{  
    print FOUT "Run in progress.  
    Run type cannot be changed while run is in progress \n";  
    ($status)=odb_cmd ("msg", "SMINFO", "", "Sname", "WARNING - Run type cannot be  
    changed while run is in progress" );  
    unless ($status) { print FOUT "Sname: Failure status after odb_cmd (msg)\n"; }  
    die " Run type cannot be changed while run is in progress\n";  
}
```

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Web Browser: /Custom (hidden)

Provides custom Web page with Midas specific HTML tags.

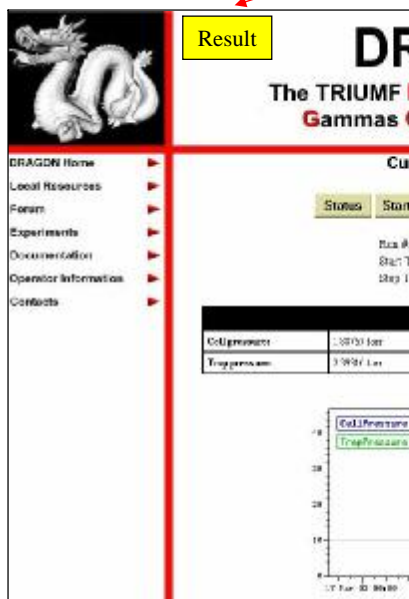
Comments:

- Standard HTML syntax.

```
[local:dragon:Stopped]/>cd Custom/  
[local:dragon:Stopped]/Custom>ls RunSummary&  
RunSummary&
```

ODB structure

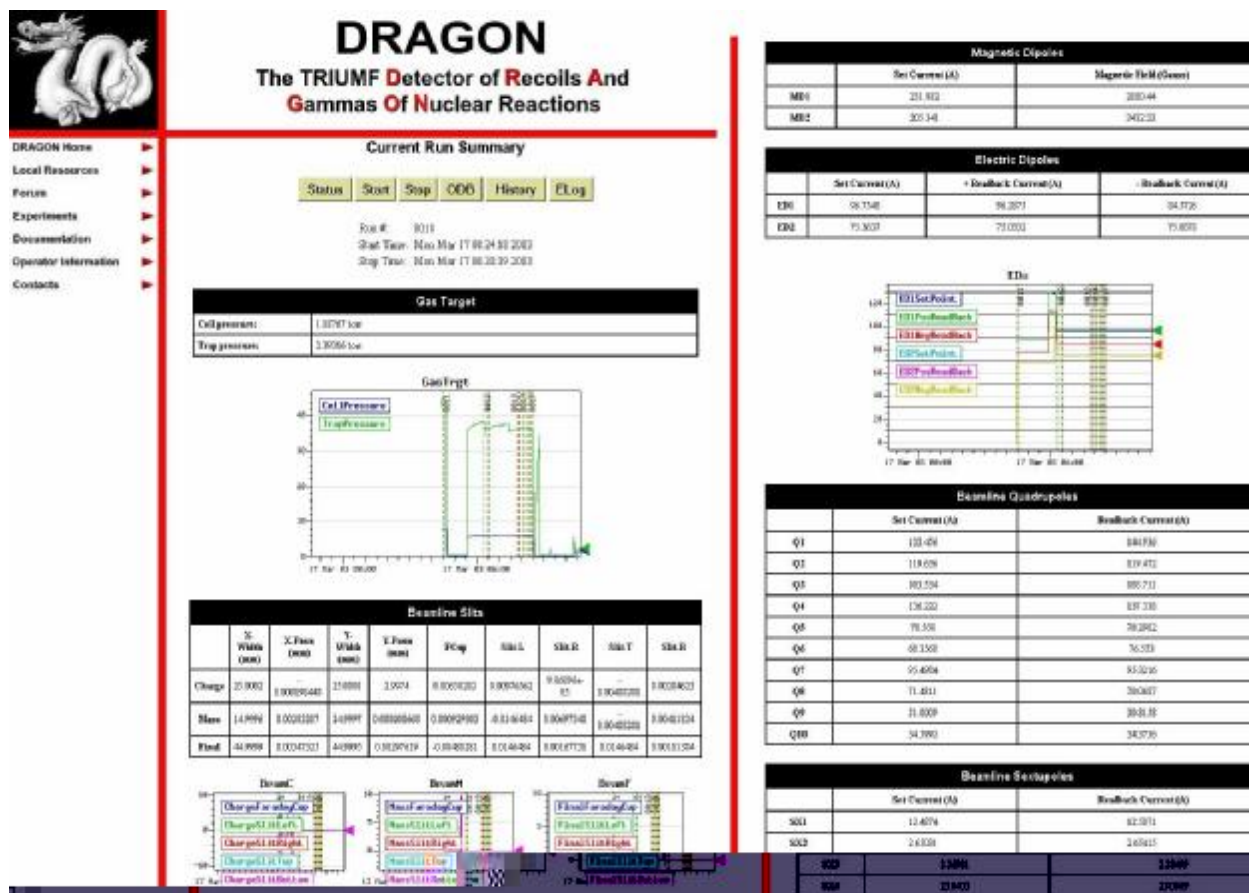
MIDAS experiment "dragon"				Tue Apr 15 14:11:15 2003 Refr:60			
Start	ODB	CNAF	Messages	ELog	Alarms	Programs	History
Start	ODB	CNAF	Messages	ELog	Alarms	Programs	History
Myscalers Fcup RunSummary							
Run #8373	Stopped	Alarms On	Restart Yes	Logging disabled			
Start: Tue Apr 15 10:20:49 2003				Stop: Tue Apr 15 13:03:07 2003			



```
[local:dragon:Stopped]/>cd Custom/  
[local:dragon:Stopped]/Custom>ls RunSummary&  
RunSummary&  
...  
<font size=5 face="Arial, Helvetica"><b><center>Current DRAGON Status</center></b></font>  
<p> <center>  
<table align=center width=90%><tr><td>  
<form method="GET" action="http://isdaq04:8081/CS/RunSummary&">  
<input type=hidden name=exp value="dragon">  
<center>  
<input type=submit name=cmd value=Status>  
<input type=submit name=cmd value=Start>  
<input type=submit name=cmd value=Stop>  
<input type=submit name=cmd value=ODB>  
<input type=submit name=cmd value=Hi story>  
<input type=submit name=cmd value=ELog>  
</center> <p> <center>  
<table border=0>  
<tr><td>Last Run: </td> <td>< odb src="/Runinfo/Run number"></td></tr>  
<tr><td>Start Time: </td> <td>< odb src="/Runinfo/Start time"></td></tr>  
<tr><td>Stop Time: </td> <td>< odb src="/Runinfo/Stop time"></td></tr>  
</table>  
<p> <table>  
<tr><td>Run Details: </td><td>< odb src="/Experiment/RunParameters/Comment"></td></tr>  
</table> </center>  
<p> <center>  
<table border=0 bgcolor=#000000 cellpadding=5 width=675>  
<tr>  
<td align=center colspan=2><b>  
<font color=#FFFFFF face="Arial, Helvetica">Gas Target</font></b></td> <td></td> </tr> <tr> <td>  
<td bgcolor=#ffffff width=150><font size=" - 1"><b>Cell pressure: </b></font></td>  
<td bgcolor=#ffffff width=525><font size=" - 1">  
<odb src="/Equipment/NewEpi cs/Variables/Epi csVars[0]"> torr</font></td>  
</tr>  
...  
Dragon
```

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Hidden slide

Experiment links:

Dragon	Custom Web page
E823	Deferred transition
uSR	Huge event, Manual trigger, Scripts
TWIST	mevb, Lazy
history	History example
LTNO	Large FE
Tigress	CAMAC, VME
8Pi	CAMAC, VME, Initial KO-ROOT
UnBC	Uni Northern B.C. lab. "Dead simple" (Prince George)

Suggested DEMO:

- Mstat (LTNO) See server timeout
- Mdump (Tigress)
- Manual Trigger (DEMO code)
- Deferred Transition (E823)
- mspeaker -t c:\winnt\media\bleep8.wav
odb> msg 32 RT03 'Midas rocks!'
- mlxspeaker -t 'play --volume=0.4 /usr/share/sounds/KDE_Dialog_Appear.wav' -s 5 &
odb> msg 32 RT03 'Linux rocks!'
- stripchart.tcl on MSCB