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BITGRABBER 2 OPERATING MANUAL

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BITGRABBER 2

OPERATING MANUAL

DRA 300898

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1 - GENERAL DESCRIPTION

1 - 1 - PURPOSE

The BITGRABBER is a high data rate digitizer using up to date digital processing technics. It operates in remote mode through Ethernet interface.

1 - 2 - MAIN CHARACTERISTICS

1 - 2 - 1 - ELECTRICAL CHARACTERISTICS

- **IF INPUT SIGNAL**
 - Input signal frequency : 1164-1310 and 1550-1610 MHz
 - Input maximum signal level : -55 dBm
 - Input impedance : 50 Ω
 - Input VSWR : ≤ 1.5 dB

- **INPUT FREQUENCY REFERENCE : 10 MHz**
 - Impedance : 50 Ω
 - Level : 0 to ± 3 dBm

1 - 2 - 2 - ENVIRONMENTAL CONDITIONS

- Operating temperature : 0°C to + 50°C
- Transport and storage temperature : -30°C to +70°C
- Relative humidity : Up to 90% without condensation

1 - 2 - 3 - NETWORK POWER SUPPLY

- Voltage : 115/230 V ± 10 % (automatic internal selection)
- Frequency : 47 to 63 Hz
- Power consumption : 250 VA max.
- Fuse value : 4ATD (Time delayed)

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1 - 2 - 4 - MECHANICAL CHARACTERISTICS

- Drawer width : Standard 15 inches
- Drawer depth : 563 mm
- Drawer height : 4 units
- Drawer weight : 20 kgs

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1 - 3 - FRONT PANEL DESCRIPTION

On front panel are located the following points:

- 2 LEDs:
 - Alarm status : Red light on when alarm is detected.
 - Power status : Green led indicates the Bitgrabber is powered.

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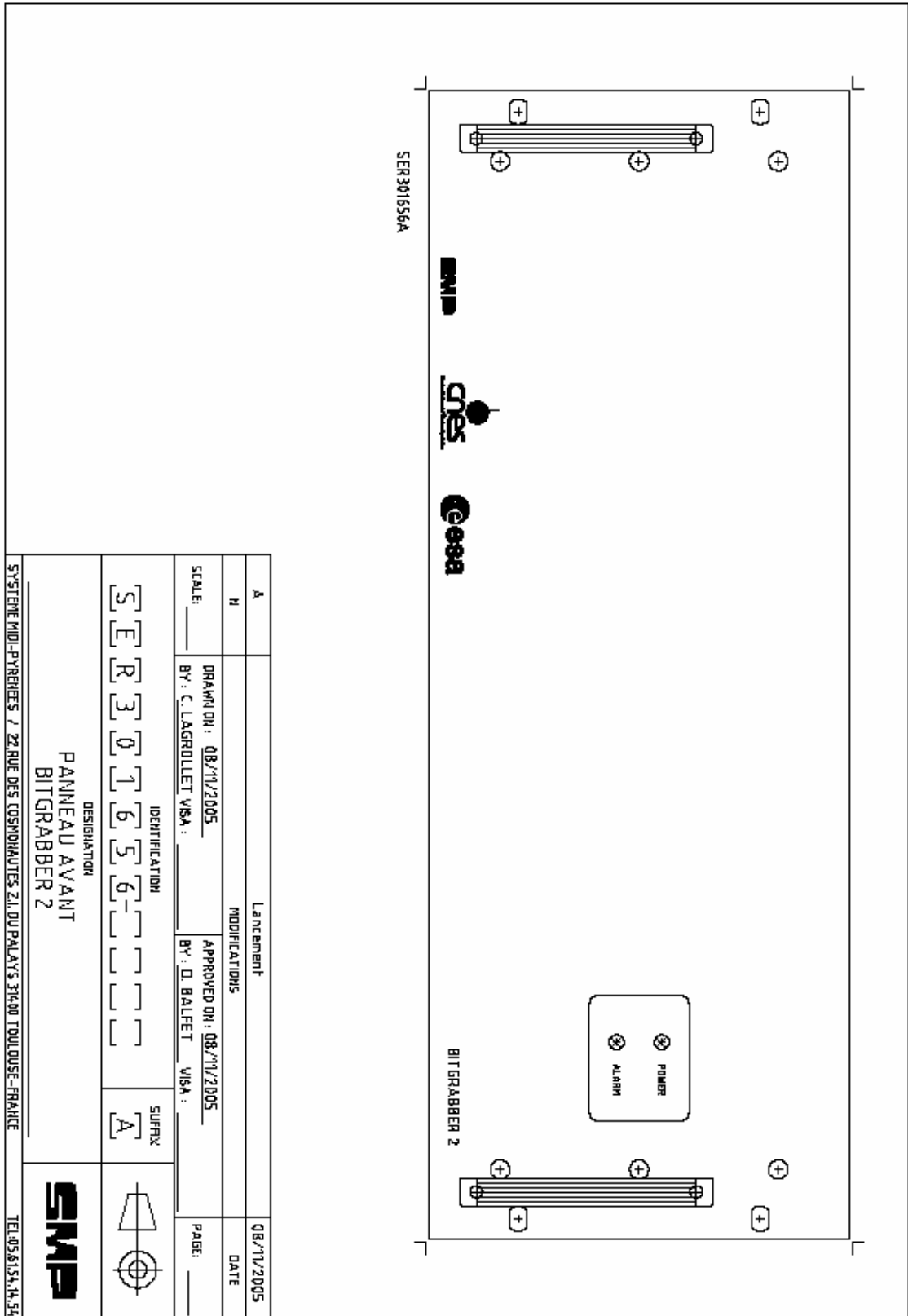


Figure 1 Front panel

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1 - 4 - REAR PANEL DESCRIPTION

On the rear panel are located:

- Main connector and fuse,
- A switch ON/OFF allows to power on the equipment,
- Various connectors to interface with input signal.
- Various connectors to interface with PC, and recorder.
- A switch to choose the IP address.

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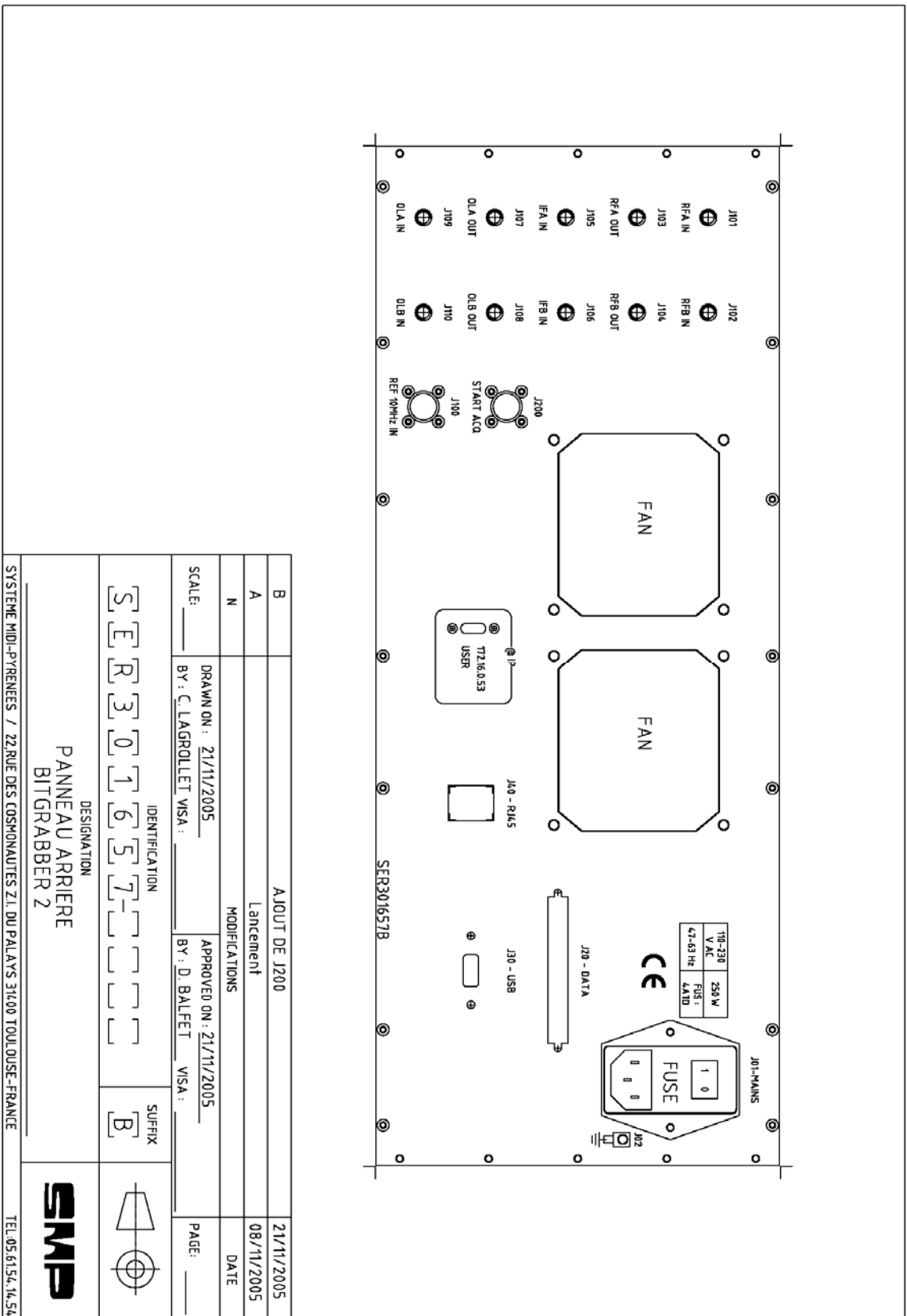


Figure 2Rear panel

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Table 1 – REAR PANEL INTERFACE

REFERENCE	FUNCTION	INTERFACE	CONNECTOR TYPE
J01	AC power	115/230 V \pm 10 % 47 to 63 Hz 250W	Europe 3 pins
J20	Communication with recorder	LVDS (see section 5-1)	HIROSE DX10BM80s
J30	USB interface	USB	USB type A
J40	Ethernet interface	Ethernet	RJ45 Female
J101 – RFA IN	RF A Sub-band signal input	1140 – 1310 MHz -100 to -55 dBm 50 Ω -VSWR _i \leq 1,5	SMA Female
J102 – RFB IN	RF B Sub-band signal input	1550 – 1610 MHz -100 to -55 dBm 50 Ω -VSWR _i \leq 1,5	SMA Female
J103 – RFA OUT	RF A Sub-band signal output	1140 – 1310 MHz -20 to -65 dBm 50 Ω -VSWR _i \leq 1,5	SMA Female
J104 – RFB OUT	RF B Sub-band signal output	1550 – 1610 MHz -20 to -65 dBm 50 Ω -VSWR _i \leq 1,5	SMA Female
J105 – IFA IN J106 – IFB IN	IF A&B channel signal input	50 – 235 MHz -20 to -65 dBm 50 Ω -VSWR _i \leq 1,5	SMA Female
J107 – OLA OUT J108 – OLB OUT	OL 1375 MHz A&B channel signal output	1375 MHz +13 dBm 50 Ω -VSWR _i \leq 1,5	SMA Female
J109 – OLA IN J110 – OLB IN	OL A&B channel signal input	1000 - 2000 MHz +13 dBm \pm 1 dB 50 Ω -VSWR _i \leq 1,5	SMA Female

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REFERENCE	FUNCTION	INTERFACE	CONNECTOR TYPE
J100 - REF	Reference input	10 MHz +0 dBm \pm 3 dB 50 Ω .	BNC Female
J200 – START ACQ	Acquisition Trigger	5V TTL (see section 5-2)	BNC Female

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2 - INSTALLATION

2 - 1 - GENERAL

This chapter provides the information concerning packing, storage and installation of the Bitgrabber 2. The detailed description of the rear panel and the list of connectors, inputs and outputs are provided in chapter 1.

2 - 2 - PACKING LIST

The product package should include the following items:

- ☞ The Bitgrabber 2,
- ☞ Operating Manual (this document),
- ☞ Power Cord,
- ☞ LVDS // Data cable,
- ☞ USB A-A cable,
- ☞ Bitgrabber CD.

2 - 3 - MECHANICAL INSTALLATION

The equipment is designed for installation in a standard 19" rack and attached by screws on the front panel.

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2 - 4 - ELECTRICAL INSTALLATION

- **Before any connection to the mains, verify the following points :**

- Setting of the voltage selector: selectable values are indicated on the voltage selector.
- Value of the fuse: depends on the value of the selected nominal voltage. Values of the fuse are indicated near the fuse holder.

The lower selected voltage needs the higher fuse value.

The higher selected voltage needs the lower fuse value.

Fuse must be Time Delayed model (TD).

- Connect the equipment to the mains voltage.
- Connect the various connectors according to their affectations.

See description of the rear panel: chapter 1 – 4.

The physical view of the panel is available at the end of this chapter.

Safety information :

All connectors with a reference number included between J20 and J199 provide voltages which values are classified T.B.T.S. (Très Basses Tensions de Sécurité/Very Low Voltage for Safety).

- Press on the “ON/OFF” switch located on the equipment rear panel.

2 - 5 - STORAGE AND USE

The limit environmental conditions indicated in chapter 1.2.2 should never be exceeded.

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2 - 6 - INSTALLING THE BITGRABBER FOR PC.

2 - 6 - 1 - MINIMUM SYSTEM REQUIREMENTS

- A USB 1.1 port,
- An Ethernet 10/100 port,
- A CD-ROM drive,
- JAVA® plug-in 1.4 (or later),
- Windows® 98/XP or LINUX for next version.

2 - 6 - 2 - INSTALLING THE BITGRABBER SOFTWARE FOR WINDOWS

Insert the Bitgrabber CD-ROM in your CD-ROM drive. Then proceed the following steps:

1. Double-click My computer.
2. Double-click the CD-ROM drive.
3. Double-click USB_SOFTWARE.
4. Copy usb.exe to the c:\windows directory.

2 - 6 - 3 - INSTALLING THE BITGRABBER DRIVERS FOR WINDOWS

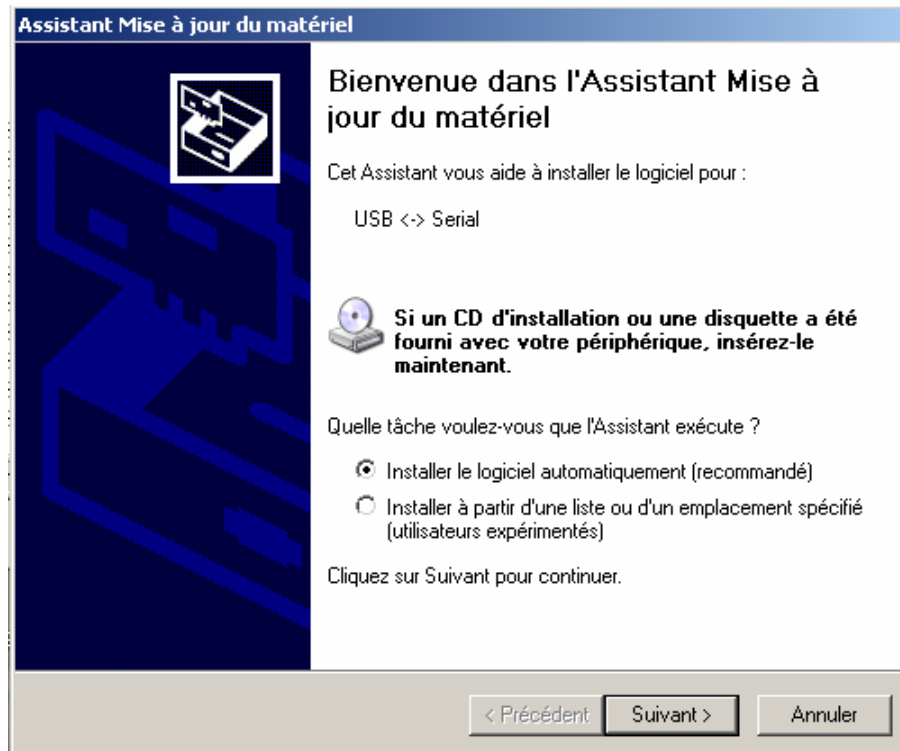
Insert the Bitgrabber CD-ROM in your CD-ROM drive.

This note assumes that you are installing the drivers in a clean system, i.e one on which Bitgrabber USB drivers have not been installed previously. If it is not the case, uninstall drivers before proceeding.

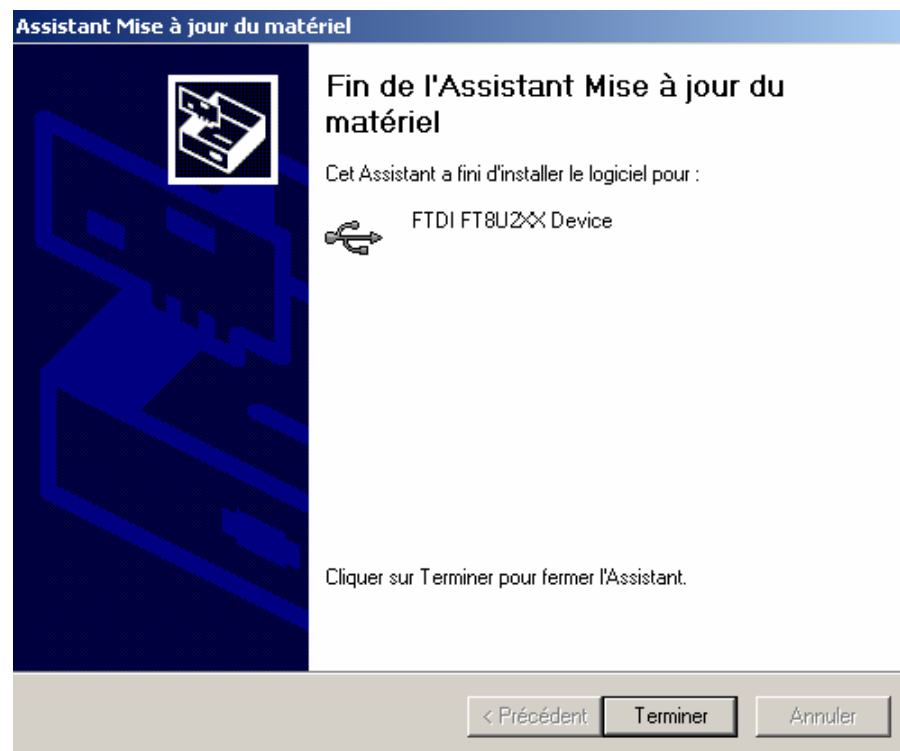
Power the Bitgrabber on.

Plug in your equipment. This should bring up a “Building Driver Information Database” followed by the Add New Hardware Wizard.

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Click next.



Select Finish.

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3 - OPERATION

3 - 1 - GENERAL

After installation (see previous chapter), the unit may be powered on.

At the end of the initialization sequence, the LED alarm must be off. In the opposite case, refer to the maintenance procedure.

The unit reaches its optimal characteristics after fifteen minutes powered-on.

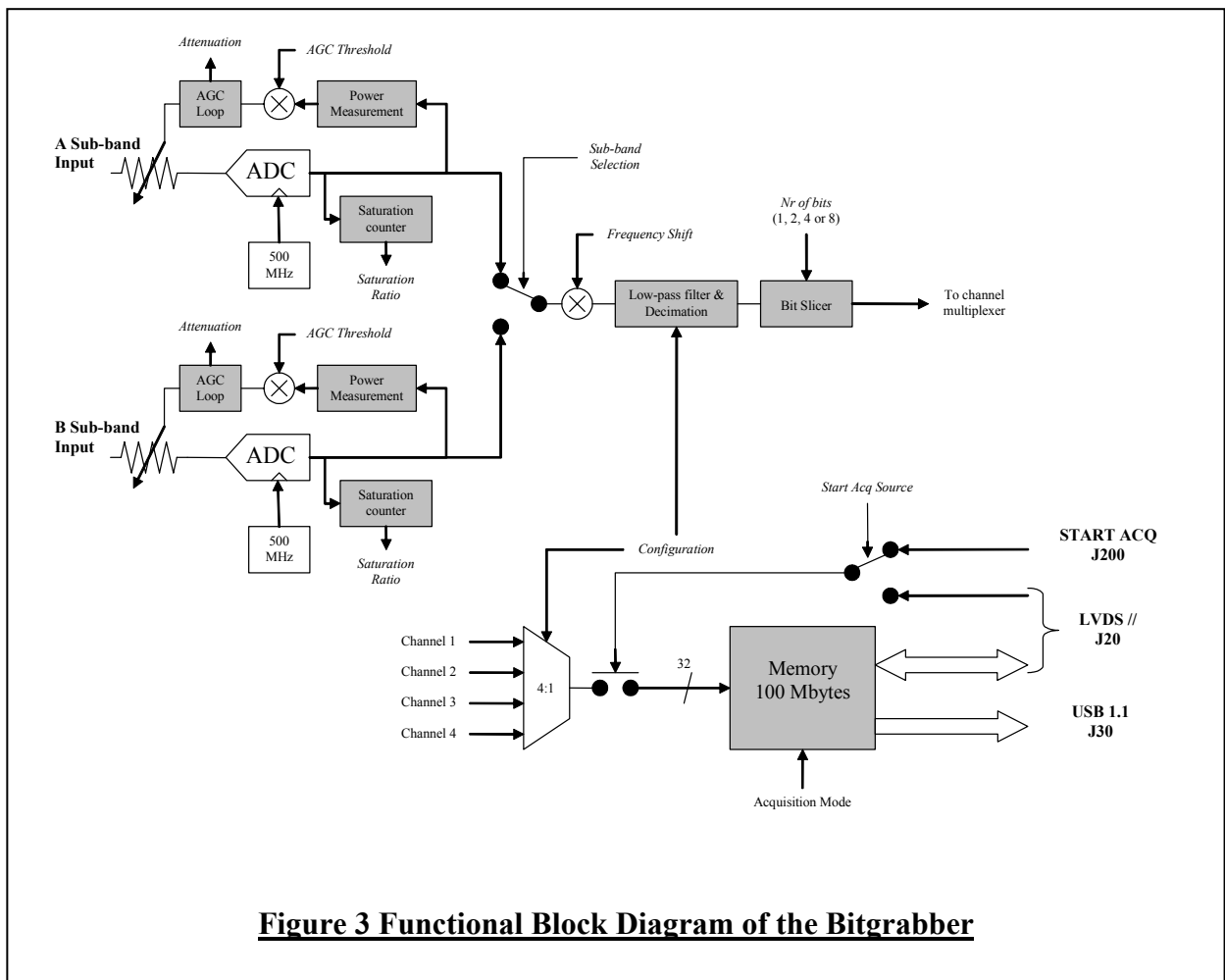
Two LEDs are used for monitoring: alarm, power on.

The Bitgrabber digitizes an IF signal and send the data to a PC or to a recorder. It has two running mode: the snapshot mode and the continuous mode.

- In the snapshot mode, the Bitgrabber fills its sample memory once. Then, the user can download the data to a computer through the USB link.
- In the continuous mode, the Bitgrabber continuously stores samples in the memory, and the recorder read the memory. If the writing throughput is greater than the reading throughput, the memory will be overflowed and the acquisition will stop.

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3 - 2 - GENERAL OPERATION



Sampling the data is the first sub-processing. two 10 bit analog to digital converters are used.

Main characteristics:

- 10 bits,
- 3.3GHz full-power input Bandwidth (-3dB),
- sampling rate of up to 2Gsp/s.

In the Bitgrabber 2 case, the sampling frequency is set to 500 MHz.

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3 - 2 - 2 - FILTERING/DECIMATION

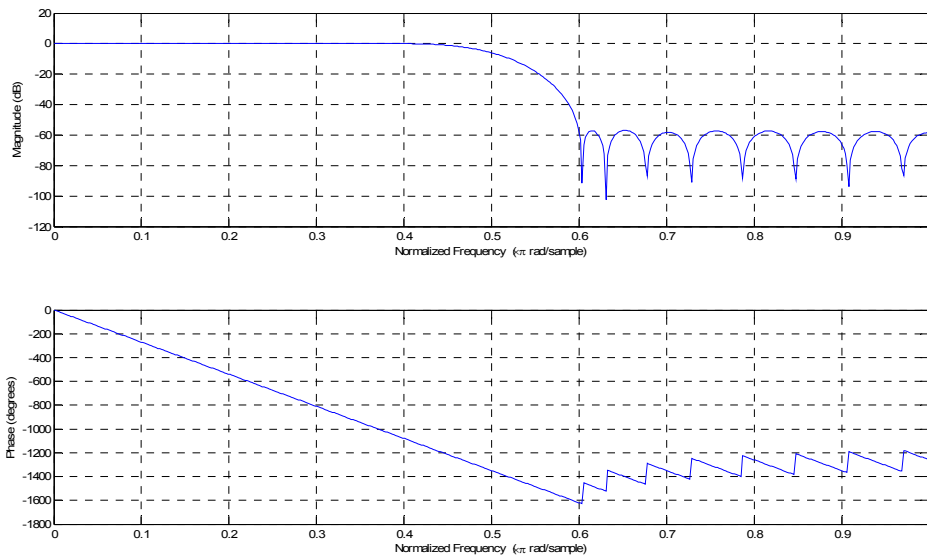
A set of half-band symmetrical Finite Impulse Response (FIR) filter followed by decimators is implemented in the Bitgrabber 2. The half-band FIR characteristics are:

- Effective bandwidth : 80 % de $F_{in}/4$
- Passband ripple : ≤ 0.05 dB
- Rejection : ≥ 55 dB

The filter coefficients are 14 bit - quantized :

Coefficients		Valeur
H0	H30	-17
H2	H28	38
H4	H26	-77
H6	H24	141
H8	H22	-244
H10	H20	422
H12	H18	-806
H14	H16	2586
H15		4096

Note : due to the halfband FIR properties, the odd coefficients are zeroed.



Halfband FIR transfer function

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3 - 2 - 3 - RECORDING FORMAT

The following decimation/quantification configurations are allowed:

- **Single channel** : Only channel 1 is available.
 - $F_s = 125, 62.5$ ou 31.25 Msps, Allowed quantifications = 1, 2, 4 or 8 bits.
- **2-channel** : Channels 1 & 2 are in use.
 - $F_s = 125, 62.5$ or 31.25 Msps, quantification = 1, 2, 4 or 8 bits.
- **3-channel**: Channels 1, 2 & 3 are in use.
 - Channel 1 = 125 Msps and channels 1 & 2 = 62.5 Msps, quantification = 1, 2 or 4 bits,
 - Channel 1 = 62.5 Msps and channels 1 & 2 = 31.25 Msps, quantification = 1, 2 or 4 bits.
- **4-channel** : Channels 1, 2, 3 & 4 are in use.
 - $F_s = 125$ Msps, 62.5 or 31.25 Msps, quantification = 1, 2 or 4 bits.

The following table describes the content of the channel multiplexer output according to the selected configuration:

Quantification	Configuration							
	31 (MSB)				0 (LSB)			
	<i>Single channel</i>							
8 bits	Q _{CH1} (t+1)		I _{CH1} (t+1)		Q _{CH1} (t)		I _{CH1} (t)	
4 bits	Q _{CH1} (t+3)	I _{CH1} (t+3)	Q _{CH1} (t+2)	I _{CH1} (t+2)	Q _{CH1} (t+1)	I _{CH1} (t+1)	Q _{CH1} (t)	I _{CH1} (t)
2 bit	Q _{CH1} (t+3)	I _{CH1} (t+3)	Q _{CH1} (t+2)	I _{CH1} (t+2)	Q _{CH1} (t+1)	I _{CH1} (t+1)	Q _{CH1} (t)	I _{CH1} (t)
1 bit	Q _{CH1} (t+3)	I _{CH1} (t+3)	Q _{CH1} (t+2)	I _{CH1} (t+2)	Q _{CH1} (t+1)	I _{CH1} (t+1)	Q _{CH1} (t)	I _{CH1} (t)
	<i>2 channels</i>							
8 bits	Q _{CH2} (t)		I _{CH2} (t)		Q _{CH1} (t)		I _{CH1} (t)	
4 bits	Q _{CH2} (t+1)	I _{CH2} (t+1)	Q _{CH1} (t+1)	I _{CH1} (t+1)	Q _{CH2} (t)	I _{CH2} (t)	Q _{CH1} (t)	I _{CH1} (t)
2 bit	Q _{CH2} (t+1)	I _{CH2} (t+1)	Q _{CH1} (t+1)	I _{CH1} (t+1)	Q _{CH2} (t)	I _{CH2} (t)	Q _{CH1} (t)	I _{CH1} (t)
1 bit	Q _{CH2} (t+1)	I _{CH2} (t+1)	Q _{CH1} (t+1)	I _{CH1} (t+1)	Q _{CH2} (t)	I _{CH2} (t)	Q _{CH1} (t)	I _{CH1} (t)
	<i>3 channels</i>							
4 bits	Q _{CH3} (t)	I _{CH3} (t)	Q _{CH2} (t)	I _{CH2} (t)	Q _{CH1} (t+1/2)	I _{CH1} (t+1/2)	Q _{CH1} (t)	I _{CH1} (t)
2 bit	Q _{CH3} (t)	I _{CH3} (t)	Q _{CH2} (t)	I _{CH2} (t)	Q _{CH1} (t+1/2)	I _{CH1} (t+1/2)	Q _{CH1} (t)	I _{CH1} (t)
1 bit	Q _{CH3} (t)	I _{CH3} (t)	Q _{CH2} (t)	I _{CH2} (t)	Q _{CH1} (t+1/2)	I _{CH1} (t+1/2)	Q _{CH1} (t)	I _{CH1} (t)

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Quantification	Configuration															
	<i>4 channels</i>															
4 bits	Q _{CH4(t)}		I _{CH4(t)}		Q _{CH3(t)}		I _{CH3(t)}		Q _{CH2(t)}		I _{CH2(t)}		Q _{CH1(t)}		I _{CH1(t)}	
2 bit																
1 bit																

3 - 2 - 4 - MEMORY MANAGEMENT SUBPROCESSING.

The memory management is divided into two parts: the writing part and the reading part. Writing in the memory is conditioned by the acquisition and reading in the memory is conditioned by the output interface to the recorder/computer.

3 - 2 - 5 - OUTPUT SUBPROCESSING

This sub-processing manages the communication between the Bitgrabber and the recorder/computer.

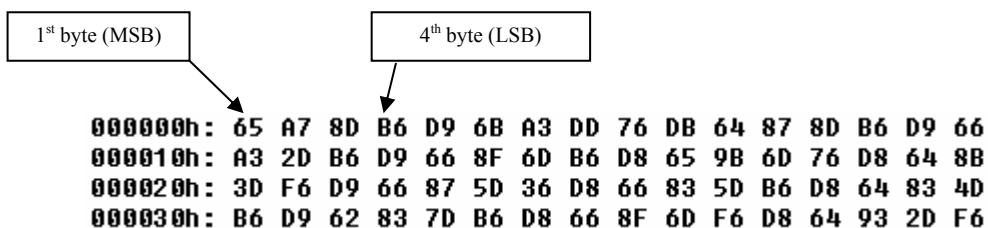
3 - 2 - 5 - 1 Snapshot mode.

In the snapshot mode, data are downloaded to the computer via the USB 1.1 link. Data are recorded in a binary file, from the oldest to the newest.

Warning: the file format is big endian. MSB is written first.

Example :

Below lies an example of a generated binary file:



3 - 2 - 5 - 2 Continuous mode

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In the continuous mode the data is loaded to a recorder through the LVDS link.

It is 38 bits wide, 36 output bits and 2 input bits.

The 36 output bits are made up of 32 data bits, 3 status bits and the clock.

The 2 input bits are status bits.

- Data bits :

The 32 bits of data are the copy of the channel multiplexer output described in the section 3 - 2 - 3 - .

- The clock :

The data transfer between the Bitgrabber and the receiver is synchronized with the clock. The clock is generated by the Bitgrabber and set to 100 MHz.

- The 3 status bit :

The 3 status bits are Data_valid, Buffer_empty, Buffer_full/Data_lost.

Data_valid :

Data_valid is set when the 32 data bits or buffer_empty status or buffer_full status are valid.

Buffer_empty :

Buffer_empty is set when the memory is empty.

Buffer_full/Data_lost :

Buffer_full/Data_lost is set when the memory is full and samples are lost.

- The 2 bits input:

The 2 input bits are Start/Stop_acq and Data_request.

Start/Stop_acq :

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In snapshot mode, when the bit goes high, the acquisition starts. The memory is filled until the memory is not full. No further acquisition can be performed until the memory is not empty.

In continuous mode, the memory is filled when start/Stop_acquisition is high.

Data_request :

When Data_request is high, the Bitgrabber sends a new sample cluster to the recorder.

3 - 3 - SNAPSHOT OPERATION

In this mode, the computer must be powered on and connected to the Bitgrabber with the USB link before the start of the acquisition.

When the command start acquisition goes high, samples fill the memory. When the memory is full, the acquisition stops and samples are loaded by the computer via the USB link. While the memory is not empty, the memory full bit is high.

The user must not send any command during the acquisition and the sample download steps.

To ensure a correct acquisition, the user must wait three seconds after the end of acquisition before a new one.

3 - 4 - CONTINUOUS OPERATION

In this mode, the recorder downloads the samples from the Bitgrabber via the LVDS link.

When the start acquisition command (J20 or J200) is high, samples fills the memory. When the memory is full, the acquisition stops. The Bitgrabber erases the memory. Few seconds later, the Bitgrabber is ready for a new acquisition.

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4 - COMMUNICATION.

4 - 1 - ETHERNET INTERFACE.

This interface uses the TCP protocol to communicate with an external controller.

The equipment is a TCP server on the port 2001.

No keep alive functions are implemented. Only one client could be connected at the same time.

Note: When using a Web browser, as soon as you are connected to the equipment via FTP protocol, the root directory is displayed. It contains the software and binaries files. No change must be done in the root directory. The 'save directory' was designed for this purpose.

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4 - 1 - 1 - CONTROL AND MONITORING.

To monitor and control equipment, verify that the cable is connected. The controller requires using the commands described below.

4 - 1 - 1 - 1 Mnemonics commands

DESIGNATION	MNEMONICS	PARAMETERS
Operating mode	MODx	0 = Continuous 1 = Snapshot
Start acquisition	STAx	0 = through recorder interface 1 = through rear panel BNC connector
Configuration Nr of channels / Decimation Factor	CNFxx	x = configuration index. See note.
Recording Bit	NBIx	1 = 1 bit 2 = 2 bits 3 = 4 bits 4 = 8 bits
AGC Mode	AGMx	0 = automatic 1 = manual
Attenuator control (in manual mode)	ATT _n xx	N = sub-band channel: 1 = Sub-band A channel, 2 = Sub-band B channel. xx = manual attenuation: 00 dB ≤ xx ≤ 20 dB
AGC Regulation Threshold	AGTxx.x	-03.0 dBFs ≤ -xx.x ≤ -20.0 dBFs
Sub-band selection	SBS _n x	n = demodulation channel index (1 to 4) x, sub-band selected: 1 = Sub-band A channel, 2 = Sub-band B channel.
Frequency shift	FRE _n sxxx.x	n = demodulation channel index (1 to 4) -250.0 Mhz ≤ sxxx.x ≤ +250.0 Mhz
IP address	IPAx _{xxx.xxx.xxx.xxx}	

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Subnet mask	SBMxxx.xxx.xxx.xxx	
Gateway	GTWxxx.xxx.xxx.xxx	
Monitoring table request	TBS?	

Note:

The following configurations are allowed:

Config.	Channel 1		Channel 2		Channel 3		Channel 4		Quantif.
	Used	Decimation	Used	Decimation	Used	Decimation	Used	Decimation	
1	Yes	1	No		No		No		1, 2, 4 or 8
2	Yes	2	No		No		No		1, 2, 4 or 8
3	Yes	4	No		No		No		1, 2, 4 or 8
4	Yes	1	Yes	1	No		No		1, 2,4 or 8
5	Yes	2	Yes	2	No		No		1, 2, 4 or 8
6	Yes	4	Yes	4	No		No		1, 2, 4 or 8
7	Yes	1	Yes	2	Yes	2	No		1, 2 or 4
8	Yes	2	Yes	4	Yes	4	No		1, 2 or 4
9	Yes	1	Yes	1	Yes	1	Yes	1	1, 2 or 4
10	Yes	2	Yes	2	Yes	2	Yes	2	1, 2 or 4
11	Yes	4	Yes	4	Yes	4	Yes	4	1, 2 or 4

Decimation by 1 means that samples throughput is set to 125 Msps, decimation by 2: 62.5 Msps and decimation by 4: 31.25 Msps.

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4 - 1 - 1 - 2 Monitoring table

Octet	D7-4	D3	D2	D1	D0	HEXA	ASCII	MEANING
1	0100	0	0	1	0	42	B	Header
2	0100	1	0	0	1	49	I	
3	0011	Fan alarm	Temperature alarm	RS alarm	Power supply alarm bit	30→3D	0→>	Alarm 1
4	0011	Sampling Rate VCO	Frequency converter VCO	Reference alarm	Reference source 0 : internal 1 : external	30→3D	0→>	Alarm 2
5	0011	0	AGC mode 0 : automatic 1 : manual	Start acq 0 : recorder 1 : BNC	Acquisition mode 0 : continuous 1 : snapshot	30→37	0→7	
6	0011	0	0	0	X	30→31	0→1	Configuration
7	0011	0	X	X	X	31→35	1→9	
8	0011	0	X	X	X	31→35	1→5	Recording bit
9	0011	X	X	X	X	30→32	0→2	Sub-band A attenuator manual control (dB)
10	0011	X	X	X	X	30→39	0→9	
11	0011	X	X	X	X	30→32	0→2	Sub-band B attenuator manual control (dB)
12	0011	X	X	X	X	30→39	0→9	
13	0011	X	X	X	X	30→32	0→2	AGC Threshold (-xx.x dBFS)
14	0011	X	X	X	X	30→39	0→9	
15	0010	1	1	1	0	2E	.	
16	0011	X	X	X	X	30→39	0→9	
17	0011	X	X	X	X	30→32	0→2	Sub-band A channel AGC gain (dB)
18	0011	X	X	X	X	30→39	0→9	
19	0011	X	X	X	X	30→32	0→2	Sub-band B channel AGC gain (dB)
20	0011	X	X	X	X	30→39	0→9	
21	0011	X	X	X	X	30→39	0→9	Sub-band A saturated sample ratio (%)
22	0011	X	X	X	X	30→39	0→9	
23	0011	X	X	X	X	30→39	0→9	Sub-band B saturated sample ratio (%)
24	0011	X	X	X	X	30→39	0→9	
25	0011	X	X	X	X	31→32	1→2	Channel 1 Sub-band selection (1 = A, 2 = B)
26	0011	X	X	X	X	31→32	1→2	Channel 2 Sub-band selection (1 = A, 2 = B)

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<i>Octet</i>	<i>D7-4</i>	<i>D3</i>	<i>D2</i>	<i>D1</i>	<i>D0</i>	<i>HEXA</i>	<i>ASCII</i>	MEANING
27	0011	X	X	X	X	31→32	1→2	Channel 3 Sub-band selection (1 = A, 2 = B)
28	0011	X	X	X	X	31→32	1→2	Channel 4 Sub-band selection (1 = A, 2 = B)
29	0100	0	1	X	1	43 or 45	+ or -	Channel 1 Frequency Shift (±xxx.x MHz)
30	0011	X	X	X	X	30→31	0→1	
31	0011	X	X	X	X	30→39	0→9	
32	0011	X	X	X	X	30→39	0→9	
33	0010	1	1	1	0	2E	.	
34	0011	X	X	X	X	30→39	0→9	
35	0100	0	1	X	1	43 or 45	+ or -	
36	0011	X	X	X	X	30→31	0→1	
37	0011	X	X	X	X	30→39	0→9	
38	0011	X	X	X	X	30→39	0→9	
39	0010	1	1	1	0	2E	.	
40	0011	X	X	X	X	30→39	0→9	
41	0100	0	1	X	1	43 or 45	+ or -	Channel 3 Frequency Shift (±xxx.x MHz)
42	0011	X	X	X	X	30→31	0→1	
43	0011	X	X	X	X	30→39	0→9	
44	0011	X	X	X	X	30→39	0→9	
45	0010	1	1	1	0	2E	.	
46	0011	X	X	X	X	30→39	0→9	
47	0100	0	1	X	1	43 or 45	+ or -	
48	0011	X	X	X	X	30→31	0→1	
49	0011	X	X	X	X	30→39	0→9	
50	0011	X	X	X	X	30→39	0→9	
51	0010	1	1	1	0	2E	.	
52	0011	X	X	X	X	30→39	0→9	
53	0011	0	Memory empty: 0: no 1: yes	Memory full: 0: no 1: yes	Acquisition: 0: no 1: yes	30→37	0→7	
54	0011	X	X	X	X	30→39	0→9	Occupancy ratio in percent
55	0011	X	X	X	X	30→39	0→9	
56	0011	X	X	X	X	30→39	0→9	
57	0011	X	X	X	X	30→39	0→9	IP address

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<i>Octet</i>	<i>D7-4</i>	<i>D3</i>	<i>D2</i>	<i>D1</i>	<i>D0</i>	<i>HEXA</i>	<i>ASCII</i>	MEANING
58	0011	X	X	X	X	30→39	0→9	
59	0011	X	X	X	X	30→39	0→9	
60	0010	1	1	1	0	2E	.	
61	0011	X	X	X	X	30→39	0→9	
62	0011	X	X	X	X	30→39	0→9	
63	0011	X	X	X	X	30→39	0→9	
64	0010	1	1	1	0	2E	.	
65	0011	X	X	X	X	30→39	0→9	
66	0011	X	X	X	X	30→39	0→9	
67	0011	X	X	X	X	30→39	0→9	
68	0010	1	1	1	0	2E	.	
69	0011	X	X	X	X	30→39	0→9	
70	0011	X	X	X	X	30→39	0→9	
71	0011	X	X	X	X	30→39	0→9	
72	0011	X	X	X	X	30→39	0→9	Subnet Mask
73	0011	X	X	X	X	30→39	0→9	
74	0011	X	X	X	X	30→39	0→9	
75	0010	1	1	1	0	2E	.	
76	0011	X	X	X	X	30→39	0→9	
77	0011	X	X	X	X	30→39	0→9	
78	0011	X	X	X	X	30→39	0→9	
79	0010	1	1	1	0	2E	.	
80	0011	X	X	X	X	30→39	0→9	
81	0011	X	X	X	X	30→39	0→9	
82	0011	X	X	X	X	30→39	0→9	
83	0010	1	1	1	0	2E	.	
84	0011	X	X	X	X	30→39	0→9	
85	0011	X	X	X	X	30→39	0→9	
86	0011	X	X	X	X	30→39	0→9	Gateway
87	0011	X	X	X	X	30→39	0→9	
88	0011	X	X	X	X	30→39	0→9	
89	0011	X	X	X	X	30→39	0→9	
90	0010	1	1	1	0	2E	.	

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<i>Octet</i>	<i>D7-4</i>	<i>D3</i>	<i>D2</i>	<i>D1</i>	<i>D0</i>	<i>HEXA</i>	<i>ASCII</i>	MEANING
91	0011	X	X	X	X	30→39	0→9	
92	0011	X	X	X	X	30→39	0→9	
93	0011	X	X	X	X	30→39	0→9	
94	0010	1	1	1	0	2E	.	
95	0011	X	X	X	X	30→39	0→9	
96	0011	X	X	X	X	30→39	0→9	
97	0011	X	X	X	X	30→39	0→9	
98	0010	1	1	1	0	2E	.	
99	0011	X	X	X	X	30→39	0→9	
100	0011	X	X	X	X	30→39	0→9	
101	0011	X	X	X	X	30→39	0→9	CR
102	0000	1	1	0	1	0D		
103	0000	1	0	1	0	0A		LF

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4 - 2 - GRAPHICAL INTERFACE.

The GUI of the Bitgrabber 2 is provided under the form of a JAVA Applet.

Note:

- The unit becomes fully operational five minutes after power-on.
- The JAVA plug-in must be installed in the browser (see the Sun Microsystems web site <http://www.sun.com> to download the JRE, Java Runtime Environment, version 1.5.0_05 or later).

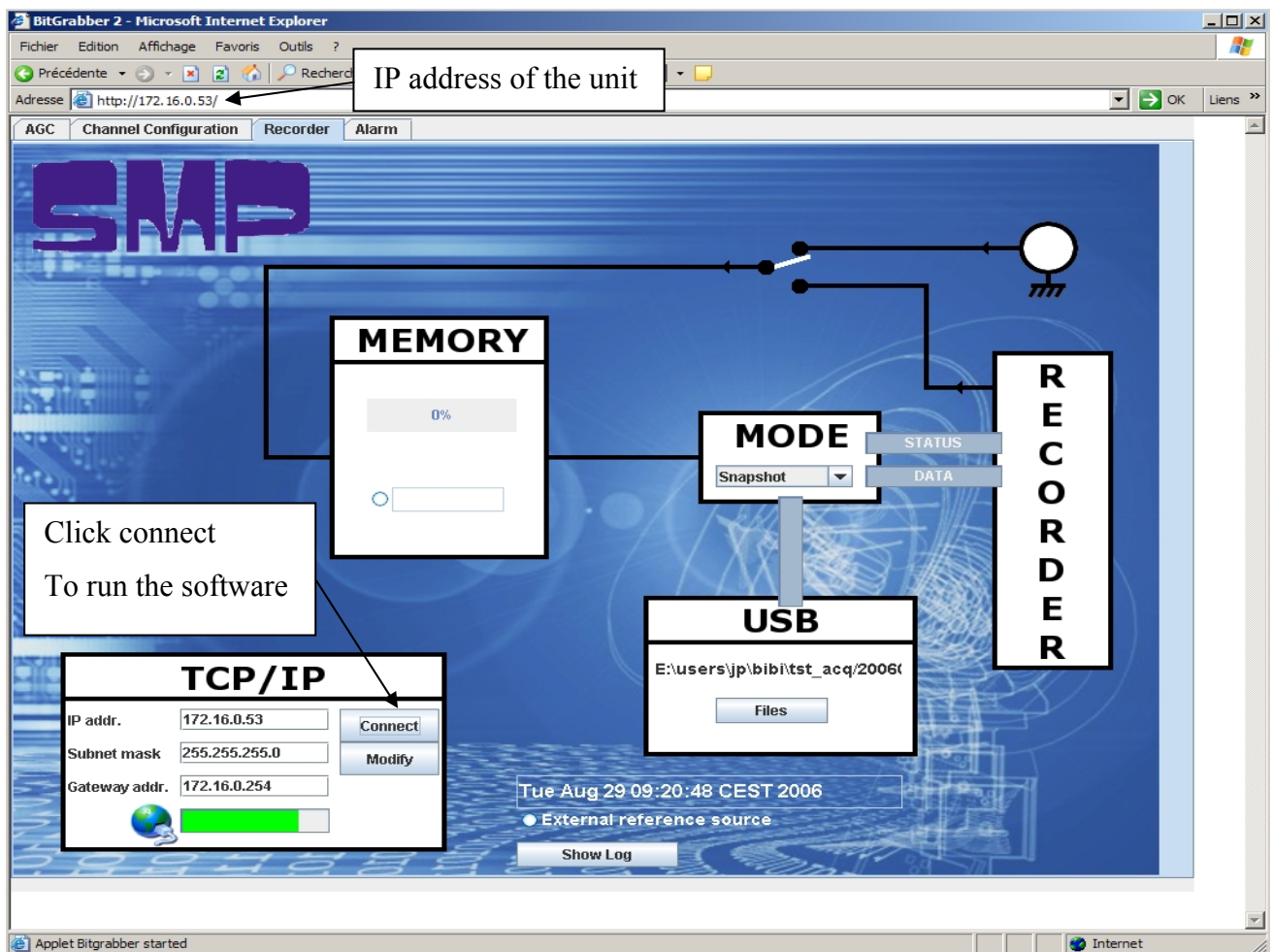
The BitGrabber 2 GUI is composed of 4 panels:

- The **AGC panel** enables setting-up and monitoring of the AGC loop of each sub-band input.
- The **Channel Configuration panel** enables configuring each demodulation channel in terms of sub-band input, frequency shift, decimation factor and quantization (1, 2, 4 or 8 bits depending on the multiplexer configuration).
- The **Recorder panel**.
- The **Alarm panel**.

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4 - 2 - 1 - RUN THE GUI.

To run the GUI, the user must open a HTTP connection at the equipment IP address using a browser such as Microsoft Internet Explorer. As soon as the graphical interface appears, the user must click “Connect” in the TCP/IP area to achieve the connection.



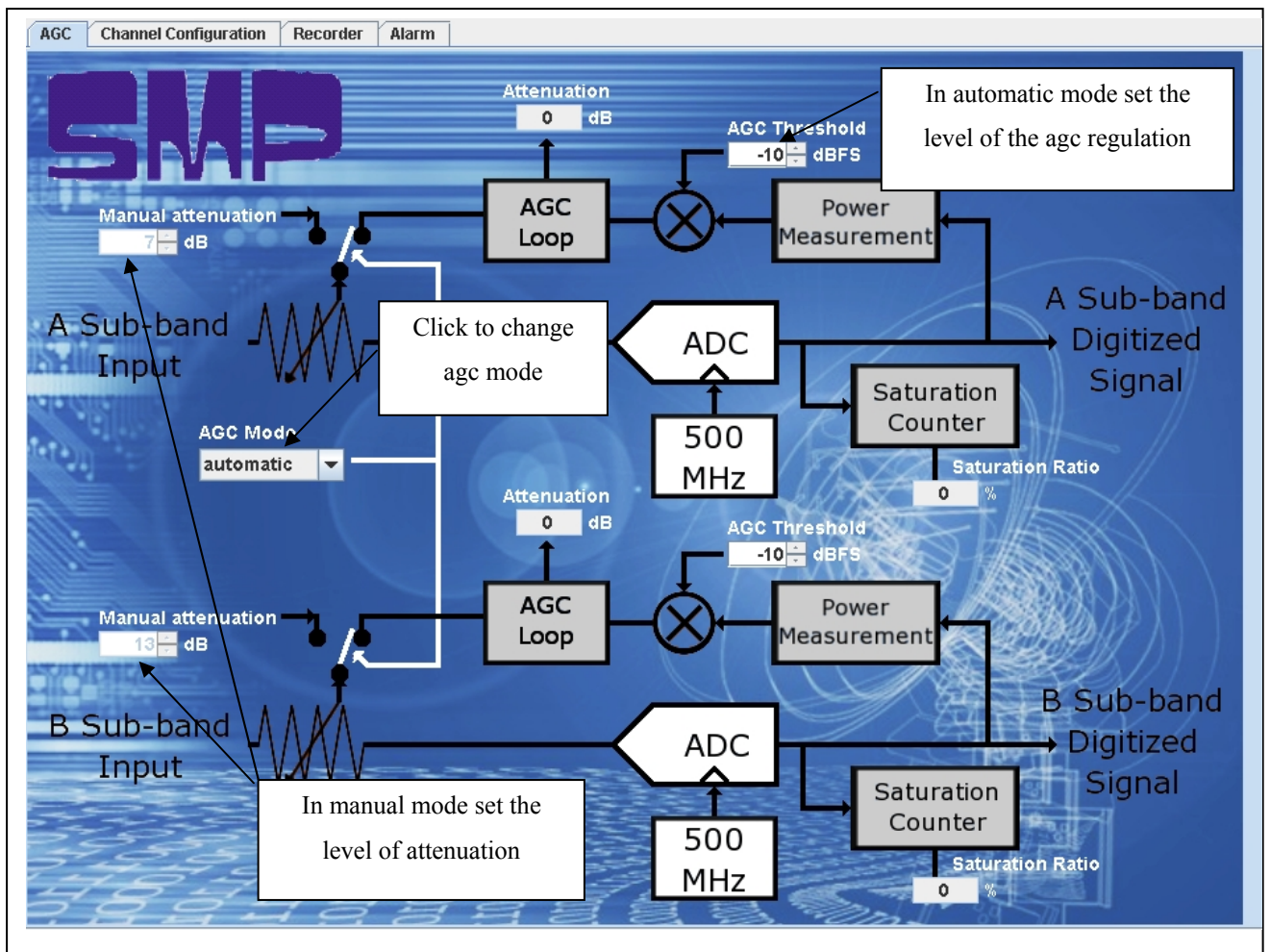
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4 - 2 - 2 - AGC CONFIGURATION

The user can set the agc in automatic mode or in manual mode.

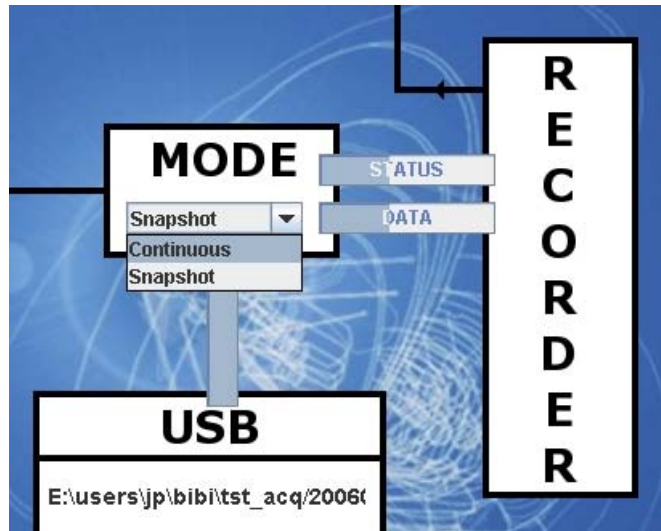
For the automatic agc, the user gives the level of the regulation.

In manual agc mode the user selects the level of attenuation for each band.



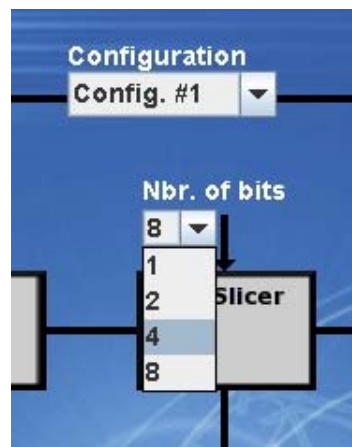
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4 - 2 - 3 - SELECT THE RUNNING MODE :



Click “Continuous” to select the continuous mode and click “Snapshot” to select the Snapshot mode. A few seconds later, the selected mode is displayed.

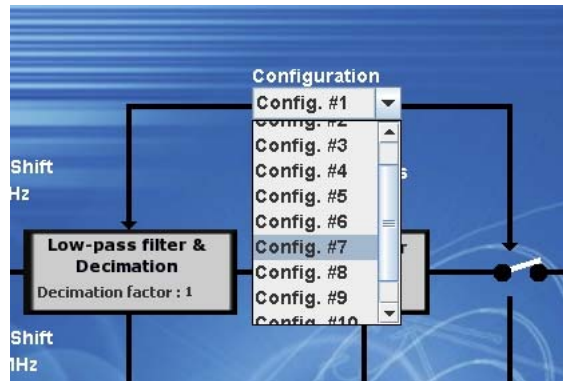
4 - 2 - 4 - SELECT THE NUMBER OF BIT:



Click “8” to select the 8 bit recording mode, click “4” to select the 4 bit recording mode, click “2” to select the 2 bit recording mode, click “1” to select the 1 bit recording mode. A few seconds later, the selected number of bit recording mode is displayed.

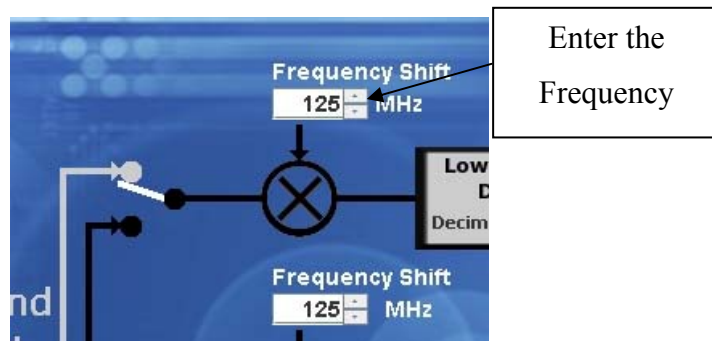
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4 - 2 - 5 - SELECT THE CHANNEL CONFIGURATION:



Click “Config. #N” to select the Nth configuration. A few seconds later, the active configuration is displayed.

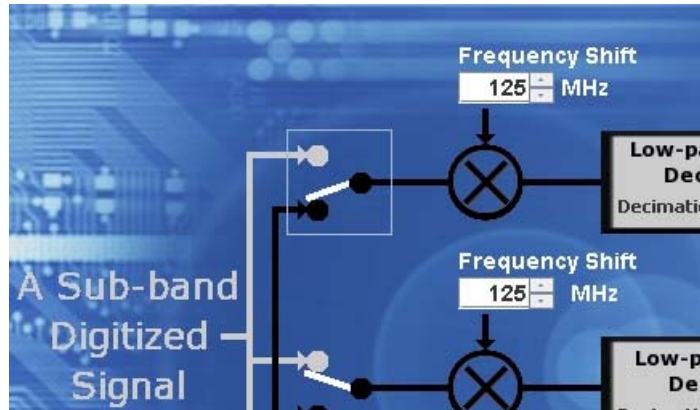
4 - 2 - 6 - SELECT THE FREQUENCY SHIFT:



For each channel, the user can choose the frequency of the synthesizer/Mixer. The Mixer spectrally shifts the input signal of the channel to DC.

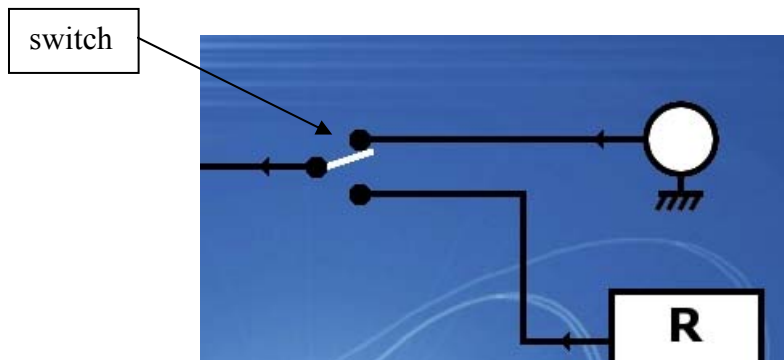
S.M.P	BITGRABBER 2 OPERATING MANUAL	Ref : OM-DRA300898-MP
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4 - 2 - 7 - SELECT THE SUB BAND



For each channel, a click on the switch changes the sub band at the input of the channel.

4 - 2 - 8 - START ACQUISITION :

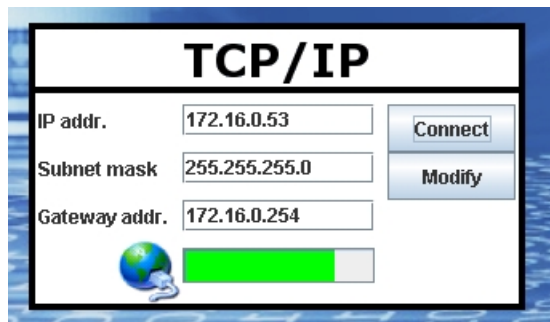


A click on the switch changes the start acquisition mode. A few seconds later, the start acquisition mode is displayed.

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4 - 2 - 9 - TCP/IP PARAMETERS :

The user can choose the TCP/IP parameters in this window.

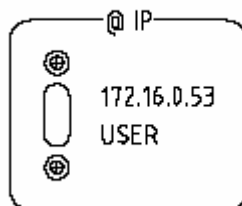


Click Modify to validate the new parameter.

Note :

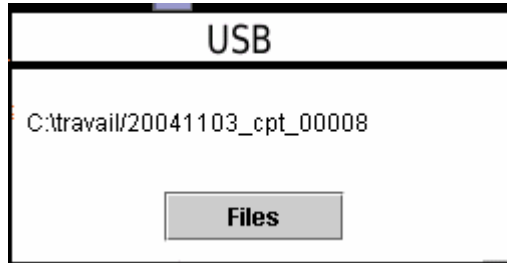
If 172.16.0.53 is selected on the rear panel and the unit is powered on, the TCP/IP address is 172.16.0.53.

If USER is selected on the rear panel and the unit is powered on, the TCP/IP address is the latest selected one.



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4 - 2 - 10 - SELECT THE NAME OF THE ACQUISITION FILE :



Select Files button from the USB window. Choose the name and the directory of the sampling file. The name of the file is made up of three parts. Each part is separated by an underscore. The first part is the date of the acquisition, the second part the name chosen by the user, and the last part is the sampling file number.

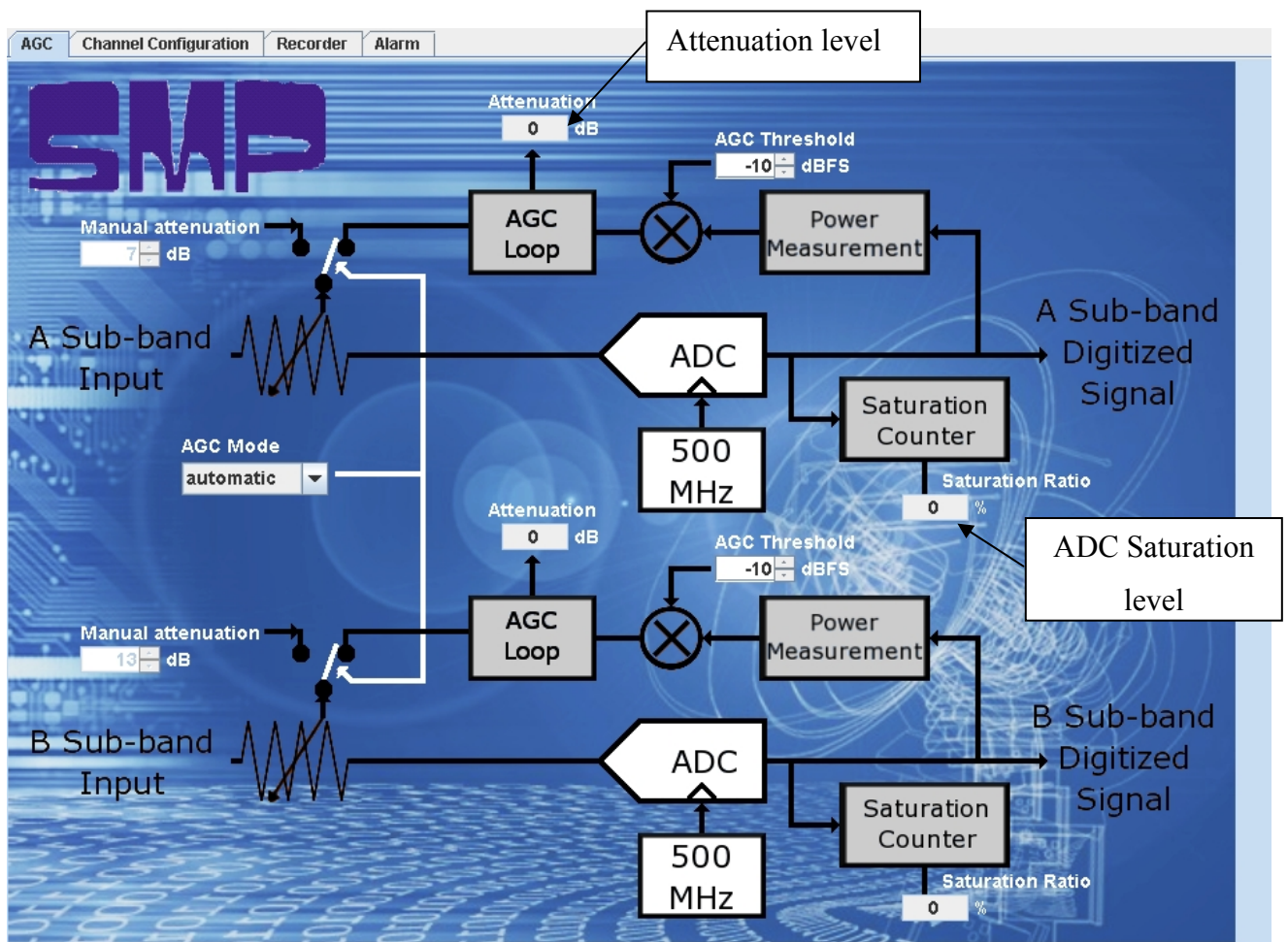
The sampling file number is zeroed when the user changes the name of the sampling file. It is incremented automatically after each acquisition or when the mode changes from continuous to snapshot.

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4 - 2 - 11 - MONITORING:

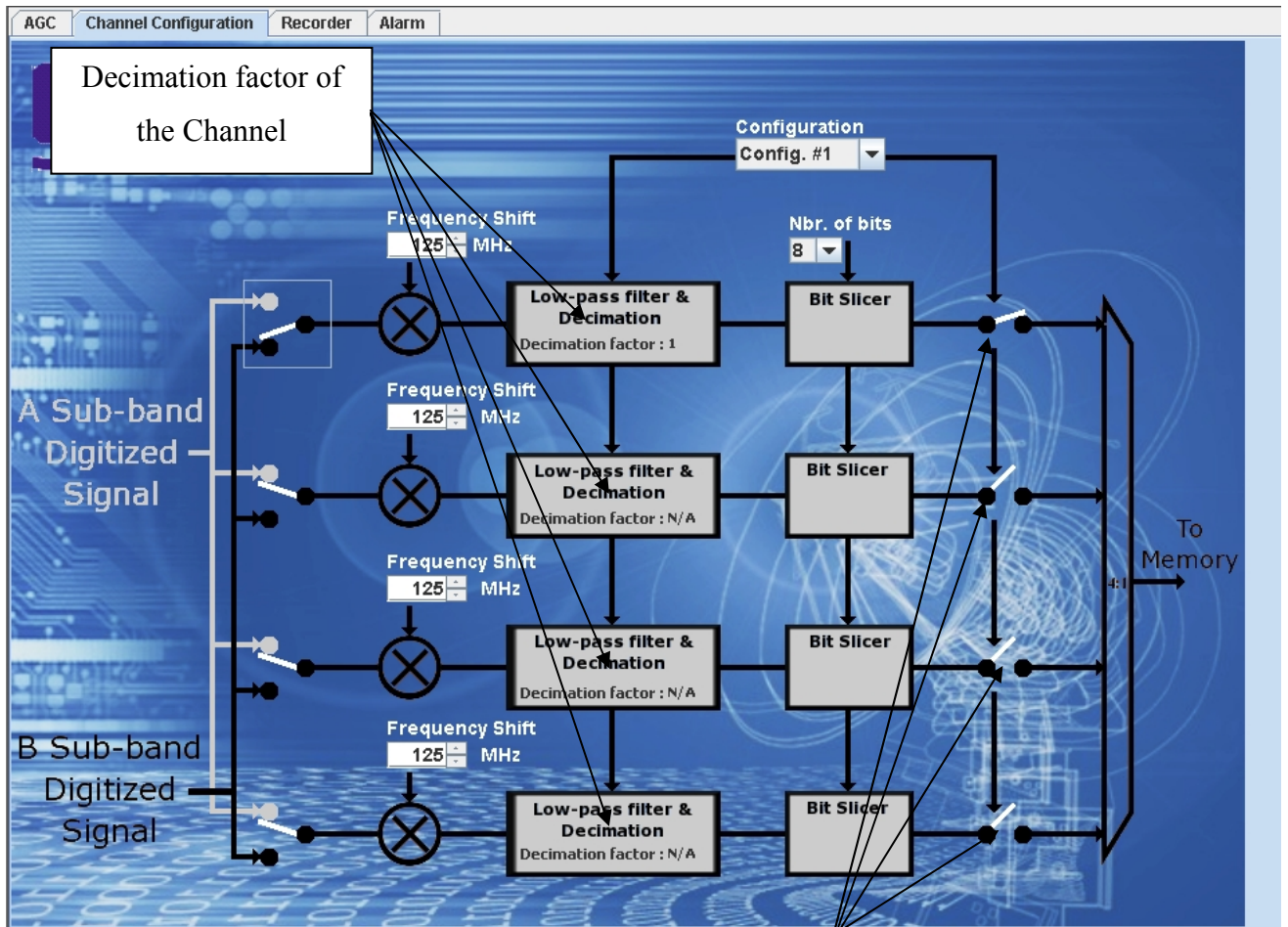
All monitoring is displayed on the graphical interface.

4 - 2 - 11 - 1 AGC monitoring



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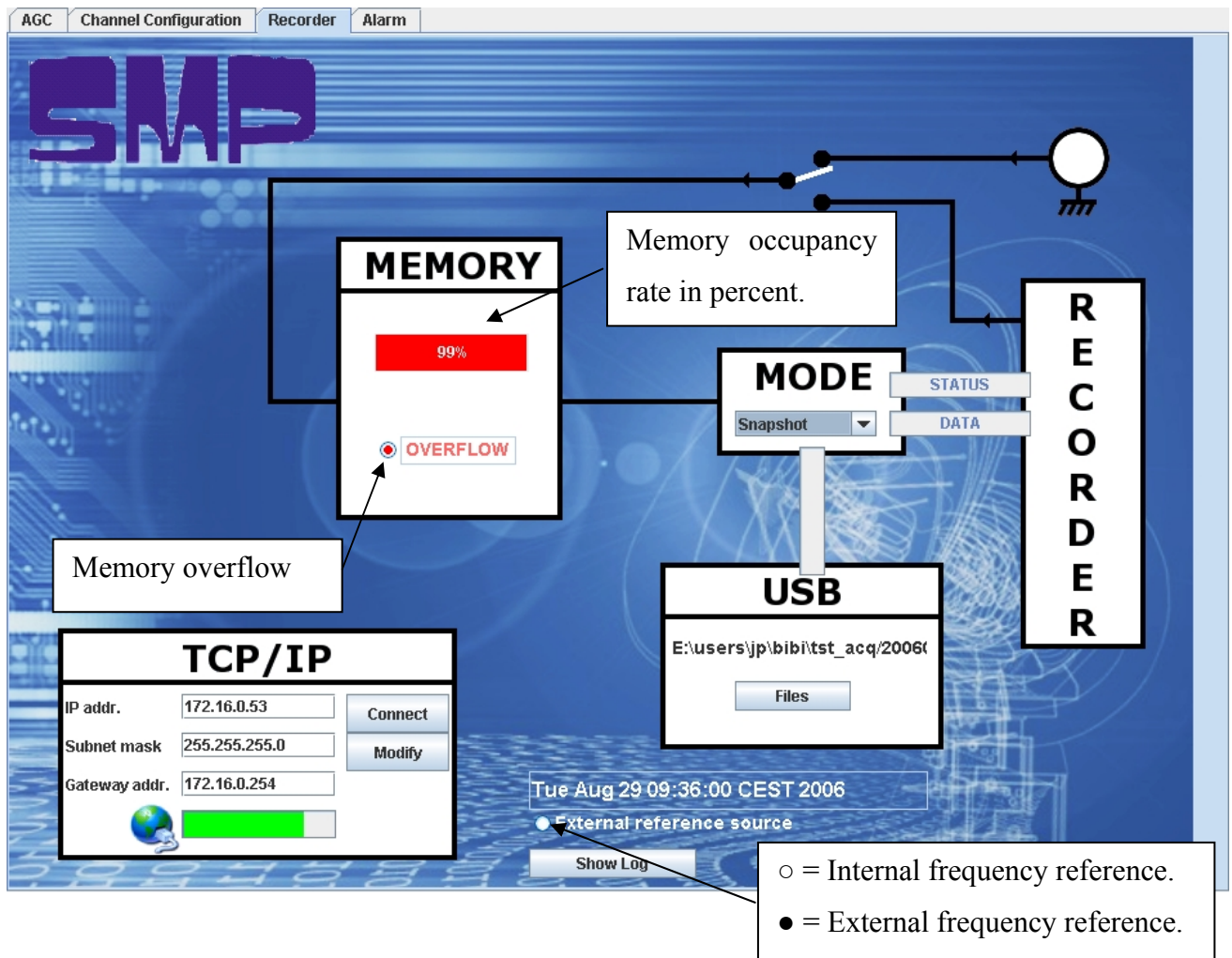
4 - 2 - 11 - 2 *Channel configuration monitoring*



Switch Off = no channel acquisition
 Switch ON = channel acquisition permitted

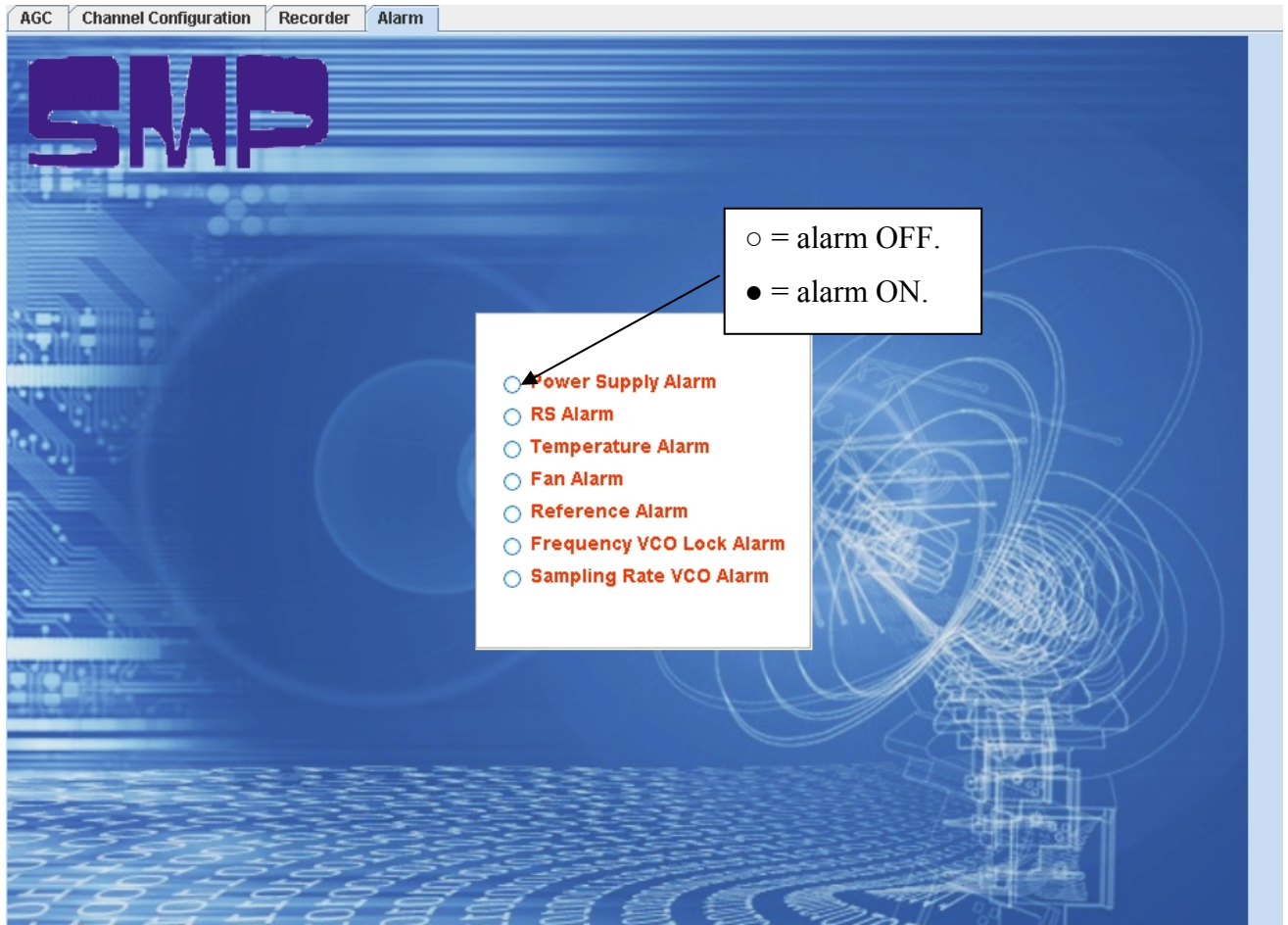
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4 - 2 - 11 - 3 Recorder monitoring



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4 - 2 - 11 - 4 *Alarm monitoring*



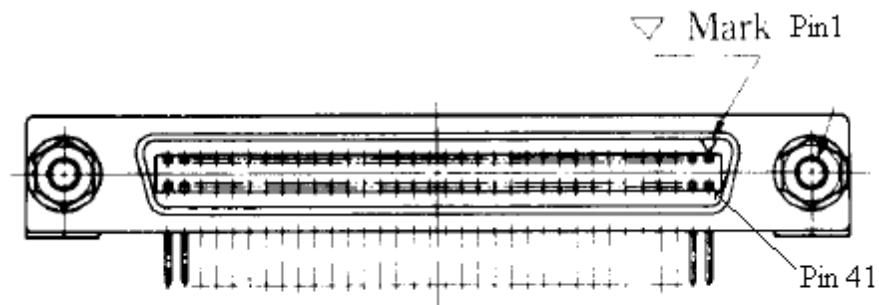
It displays the status of the BitGrabber alarms :

- Fan alarm,
- Temperature alarm
- RS alarm
- Power supply alarm
- Sampling rate VCO lock status
- Frequency converter VCO lock status
- Reference internal alarm

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5 - ELECTRICAL CHARACTERISTICS

5 - 1 - CONNECTOR J20 :



Connector J20 DX10BM80s

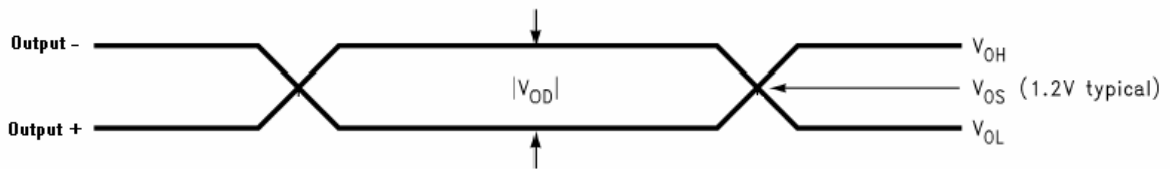
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<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>
1	DATA0-	41	DATA0+
2	DATA1-	42	DATA1+
3	DATA2-	43	DATA2+
4	DATA3-	44	DATA3+
5	DATA4-	45	DATA4+
6	DATA5-	46	DATA5+
7	DATA6-	47	DATA6+
8	DATA7-	48	DATA7+
9	DATA8-	49	DATA8+
10	DATA9-	50	DATA9+
11	DATA10-	51	DATA10+
12	DATA11-	52	DATA11+
13	DATA12-	53	DATA12+
14	DATA13-	54	DATA13+
15	DATA14-	55	DATA14+
16	DATA15-	56	DATA15+
17	DATA16-	57	DATA16+
18	DATA17-	58	DATA17+
19	DATA18-	59	DATA18+
20	DATA19-	60	DATA19+
21	DATA20-	61	DATA20+
22	DATA21-	62	DATA21+
23	DATA22-	63	DATA22+
24	DATA23-	64	DATA23+
25	DATA24-	65	DATA24+
26	DATA25-	66	DATA25+
27	DATA26-	67	DATA26+
28	DATA27-	68	DATA27+
29	DATA28-	69	DATA28+
30	DATA29-	70	DATA29+
31	DATA30-	71	DATA30+
32	DATA31-	72	DATA31+
33	CLK-	73	CLK+
34	DATA VALID-	74	DATA VALID+
35	BUFFER EMPTY-	75	BUFFER EMPTY+
36	BUFFER FULL/DATA LOST-	76	BUFFER FULL/DATA LOST+
37	START/STOP ACQ-	77	START/STOP ACQ+
38	DATA REQUEST-	78	DATA REQUEST+
39	GND	79	DEBUG1
40	GND	80	DEBUG2

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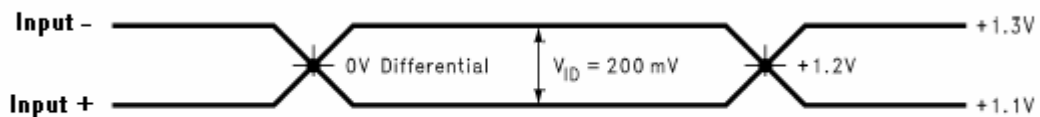
5 - 1 - 1 - OUTPUT CHARACTERISTIC

Symbol	Parameter	Conditions	Pin	Min	Typ	Max	Units
V_{OD1}	Differential Output Voltage	$R_L = 100 \Omega$	All outputs	250	350	450	mV
V_{OS}	Offset Voltage			1.125	1.25	1.375	V
V_{OH}	Output Voltage high				1.38	1.6	V
V_{OL}	Output Voltage Low			0.9	1.03		V

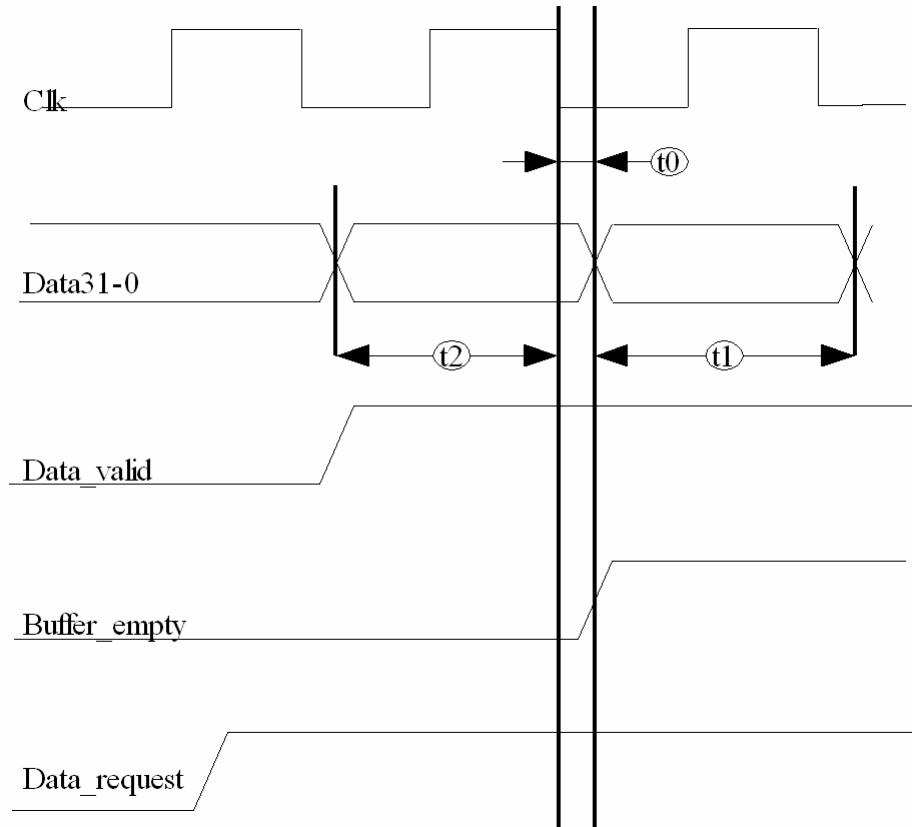


5 - 1 - 2 - INPUT CHARACTERISTIC

Symbol	Parameter	Conditions	Pin	Min	Typ	Max	Units
V_{TH}	Differential Input High Threshold	$V_{CM} = +1.2V$	All inputs		+20	+100	mV
V_{TL}	Differential Input Low Threshold			-100	-20		mV
V_{CMR}	Common-Mode Voltage range	$V_{ID} = 200mV$ peak to peak		0.1		2.3	V
V_I	Input Voltage			-0.3		3.9	V



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Symbol	Parameter	Pin	Min	Typ	Max	Units
<i>t0</i>	Data hold	All	1			ns
<i>t1</i>	Data valid	outputs without clk	8			ns
<i>t2</i>	Setup Time	clk	3			ns

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5 - 2 - CONNECTOR J110:

Symbol	Parameter	Min	Typ	Max	Units
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
V_I	Input Voltage	0		5.5	V

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6 - MAINTENANCE

If you are experiencing any unusual behaviour, power off the Bitgrabber and contact SMP for assistance.

CAUTION :

Do not open the Bitgrabber.

Dangerous and potentially fatal voltages are present in this equipment when its power supply cable is connected to the 230 V network.