EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH CERN — AB DEPARTMENT

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Proton Integration for Cern's on-line Isotope Separator Facility

New Version

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Abstract

The Proton Integrator counts the number of protons hitting a given target in CERN's on-line isotope separator facility ISOLDE.

1. Introduction

The ISOLDE PS-Booster facility is equipped with two isotope separators (GPS and HRS) which are dedicated to the production of a large variety of radioactive ion beams for a great number of different experiments, e.g. in the field of nuclear and atomic physics, solid-state physics, life sciences and material science.

The General Purpose Separator (GPS) is designed to allow three beams, within a mass range of $\pm 15\%$, to be selected and delivered to the experimental hall. The magnet is double focussing H-magnet with a bending angle of 70° and a mean bending radius of 1.5 m. The mass resolving power is M/ Δ M=2400.

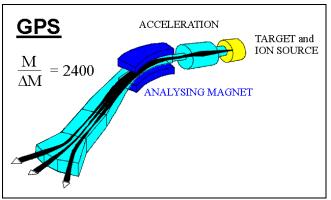


Fig 1. GPS Separator.

The High Resolution Separator (HRS) is equipped with two bending C-magnets with bending angles 90° and degrees, respectively. At the 60° moment one single mass, with a resolution of about M/ Δ M=5.000, can be separated routinely with the HRS separator. The calculated beam profiles for the masses 99, 100 and 101 are shown in the figure. It will be possible to achieve a maximal resolution of more than 30.000.

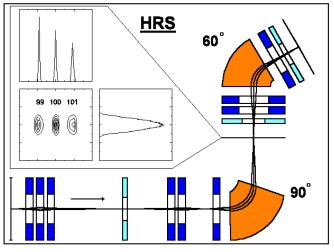


Fig 2. HRS Separator.

The aim of the proton integrator is to count how many protons hit the given target.

2. Proton Integrator User's Guide

The application is launched from the ISO Console Manager through the GPS or HRS menu:

CCM 1						Operational configuration: ISOO			
<u>F</u> ile	Measur	Sequence	General	Synoptics	GPS	HRS	WorkingSet	<u>A</u> ctive Tasks	
						Target I Tape St HT Com Mass Co Mass Sc Gas Mix			
					<u>&</u> 1	File Cho	ntegrator Doser for GPS TAR Configurati	on	

Fig 3. GPS Menu in the ISO Console Manager.

CCM 1 Operati						rational conf	iguration: ISOC	
<u>F</u> ile	Measur	Sequence	General	Synoptics	GPS	HRS	WorkingSet	<u>A</u> ctive Tasks
						T S H S N	arget Heater HF arget Heater HF ape Station HRS T Control HRS lass Control M/ lass Control M/	NS (NEW) 3 NG60
						S F	roton integrato ile Chooser for ollaps Cycler IRS VISTAR Com	HRS

Fig 4. HRS Menu in the ISO Console Manager.

2.1 Interfaces

There are two proton integrators depending on which separator (GPS and HRS) the count has to be done.

ISOLDE Proton Integrator 🔹							
😰 🗹 🚣 🔕 🕂 🗖 🔶 Jan 30 12:12:10 ASYNC - 2000 🛛 ASYNC							
Integrator GPS							
Control GPS	Integrator Count in protons	Intensity in microAmps.h	Window Time	Number Of Shots			
Short 💌 ON	0.0	0	Od Oh Omin Osec	0			
Long 💌 ON	0.0	0	Od Oh Omin Osec	0			
Vistar 💌 ON	0.0	0	Od Oh Omin Osec	0			
				1			

Fig 5. GPS Interface

-	ISOLDE F	roton integrator		•			
📴 🗹 🚣 🔕 🕂 🗖 🗢 Jan 30 12:11:32 ASYNC - 2000 ASYNC							
Integrator HRS							
Control HRS	Integrator Count in protons	Intensity in microAmps.h	Window Time	Number Of Shots			
Short 💌 ON	0.0	0	Od Oh Omin Osec	0			
Long 🔽 ON	0.0	0	Od Oh Omin Osec	0			
Vistar 🛡 ON	0.0	0	Od Oh Omin Osec	0			
				7			

Fig 6. HRS Interface

In this new version three types of counters totally **independent** are displayed simultaneously:

- The Short Counter, could be used for cycle-by-cycle or daily measurements.
- **The Long** one is useful for long term measurements, for example measurements lasting for weeks or months.
- The Vistar Counter can be used for a specific target.

For each of those measurements *durations*, *number of cycles*, *intensities*, *proton counts* and *statuses* are displayed.

2.2 Action Menu

Integrator	GPS
Control GPS	Integrator Count in protons
Short ON OFF	0.0
RESET	0.0
Vistar 💌 ON	0.0

Each counter can be controlled separately by its own menu:

- **ON:** Start or restart the counter if it has been stopped and not reset.
- **OFF:** Stop the counter without resetting it.
- **RESET:** set all the counter values to 0.



3. References

[1] Isolde home page, http://isolde.web.cern.ch/ISOLDE/