## EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH CERN — AB DEPARTMENT

CERN-AB-NOTE-2008-009-OP

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

New Version

## Y. Riva

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  $70^{\circ}$  and a mean bending radius of 1.5 m. The mass resolving power is M/ $\Delta$ M=2400.

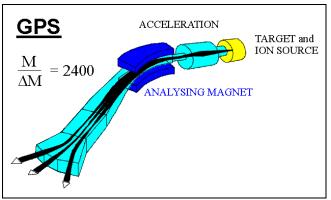


Fig 1. GPS Separator.

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/ $\Delta$ 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.

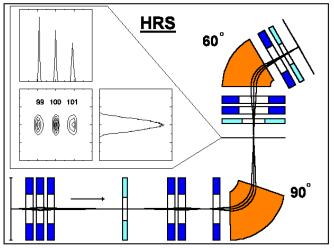


Fig 2. HRS Separator.

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>&amp;</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/