Version 7.6 - 10/6/2010

doc 2843

Input value	
Calculated	

Quality	Meaning
***	Stable, well understood parameter
**	Reasonably well defined parameter
*	Rough estimate

Parameter	Value	Units	Quality	Req ID	Notes
Concrete pit thickness	0.5	m	***	FR.Det.LAr ESH.STD	
Pit Width	19.0	m			
Pit Depth	18.5	m			
Pit Length	77.0	m			
Pit Volume	27066	m^3			
Pit Surface Area	6478	m^2			
Insulation heat loss	30	kW			
Electronics					
Mux level	3840		**	FR.Det.LAr Purity	Ref docdb
Readout redundancy	2		**		Split readout channels 2x
Analog front end power	10	mW/chan	**	FR.Det.LAr OperCost	Design goal
Digital front end power	5	mW/chan	*	FR.Det.LAr OperCost	Needs to be defined
Power conversion efficiency	80%		**	FR.Det.LAr OperCost	
Electronics power dissipation	19	mW/chan			
Electronics power total	12.1	kW			
ENC	743	electrons	***		Paul Rubinov parameterization. Ref BNL docdb 626 (can't find it! Has it moved?)
dE/dx (1 MIP)	2.1	MeV/cm	***		
W ion (ionization energy)	23.6	eV	***		
Recombination factor @ 500 V/cm	70%		***		NIM A523, 3 (2004)
Ionization 1 MIP - min	18686	electrons			
Electron drift velocity	1.6	mm/msec	***		Drift velocity for 500 V/cm electric field
Electron drift time	1.54	ms			
Electron lifetime assumption	1.4	ms	**	FR.Det.LAr Purity	Set to achieve minimum S/N = 8
Equivalent O2 contamination	214	ppt		FR.Det.LAr Purity	
Signal to noise ratio - max	25				
Signal to noise ratio - min	8			FR.Det.LAr Purity	
ADC sampling rate	2	MHz	**	FR.Phy.LAr Muons	Same as ICARUS, MicroBooNE and ArgoNeuT
Num MIP dynamic range	15		**		15 MIP ionization is a reasonable maximum value
ADC resolution - min	9	bits	**	FR.Phy.LAr Muons	Minimum value required
High Voltage					
Drift field	500	V/cm	***		Same as ICARUS, MicroBooNE and ArgoNeuT
Cathode high voltage	123	kV			
Num cathode HV feedthrough	8		*	FR.Phy.LAr Oper	2 FT's on each CPA row
Grid bias voltage	-480	V	***		Adjust to achieve transparency. Doc #2833
U plane bias voltage	-280	V	***		Adjust to achieve transparency. Doc #2833