

ICTs for AWAKE

25/3/2021

ICT

- Purpose: measure electron bunch after plasma cell to provide calibration to spectrometer
- Requirements ~~to be defined~~ / confirmed after meeting 28/4/2021
 - single bunch measurements (2-5 ps sigma BL)
 - 10 Hz repetition rate
 - range: ~~500 pC~~ 100 pC
 - resolution < 1 pC
- Proposed solution: Integrating Current Transformer (ICT) from Bergoz instrumentation (next slide)
- Where and how many to install: two, one “close to dipole”, one ‘close to plasma cell’
- When to install: to be defined

- Purchase in flange ICT from Bergoz Instrumentation
<https://www.bergoz.com/products/beam-charge-measurement/>
- Lead time 12 weeks ARO
- Readout electronics CERN
- With 5-turn CT, 5 MHz BW and CERN electronics (TRIC) signal is 160 ns bunch (4sigma) with peak amplitude approx. 50 mV

Beam Charge Monitor - Integrate-Hold-Reset

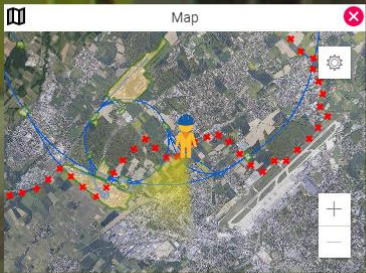
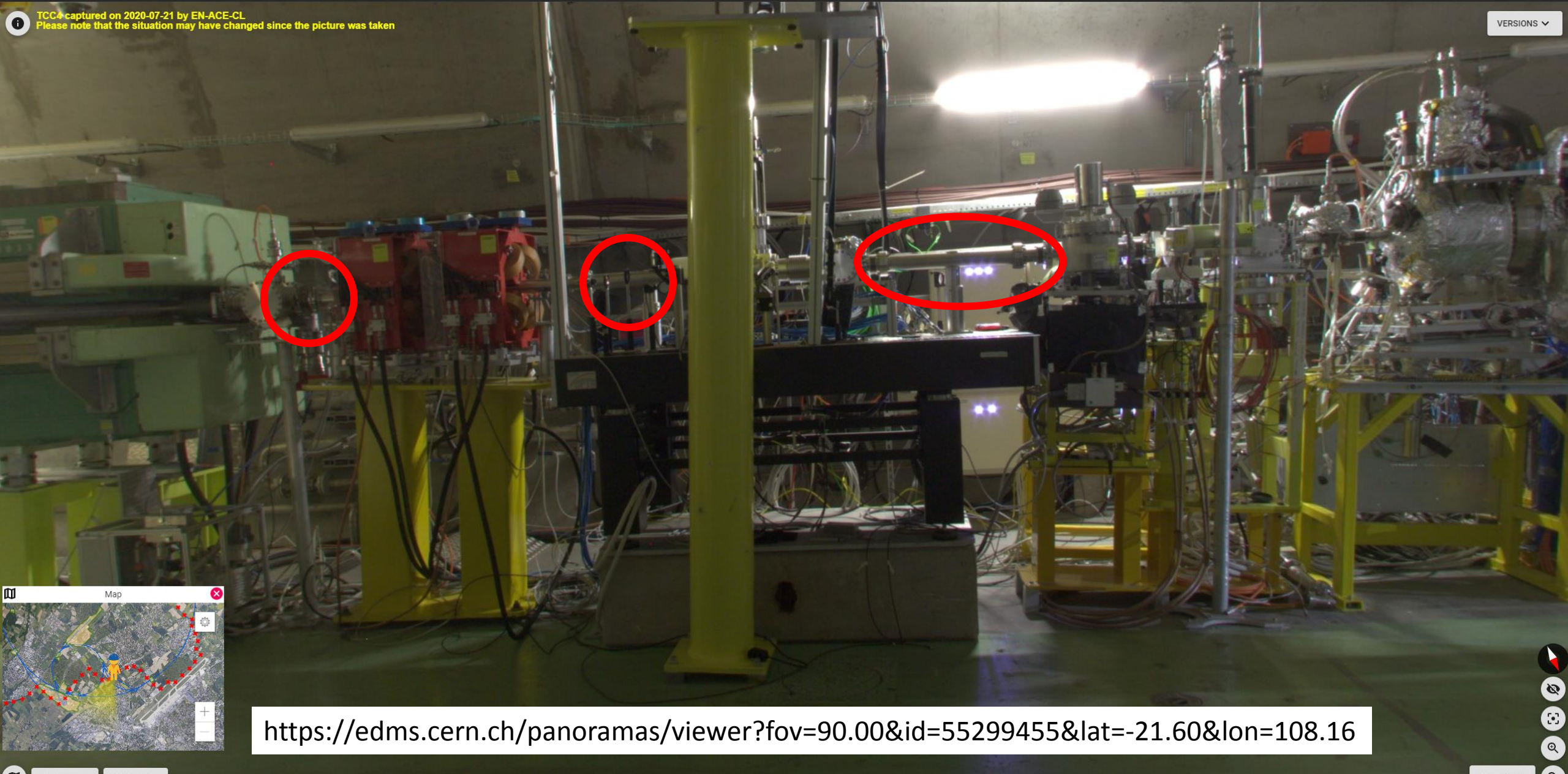
Full scale ranges Selectable in a range of 50:1 by TTL
 Most sensitive range 800pC, using 5Vs/C ICT
 Least sensitive range 400nC, using 0.5 Vs/C ICT
 Range control Full scale and polarity (4 TTL bits)
 Noise on single bunch 0.55pCrms, limited by dynamic range
 Dynamic range >35'000, limited by resolution

In-flange ICT sensor order code	Pipe OD	Mating flange	ID (mm)
ICT-CF3"-3/8-22.2-40-UHV-xx	1"	DN/NW50CF	22.2
ICT-CF4"1/2-34.9-40-UHV-xx	1.5"	DN/NW63CF	34.9
ICT-CF4"1/2-38.0-40-UHV-xx	40	DN/NW63CF	38.0
ICT-CF6"-47.7-40-UHV-xx	2"	DN/NW100CF	47.7
ICT-CF6"-60.4-40-UHV-xx	2.5"	DN/NW100CF	60.4
ICT-CF6"3/4-96.0-40-UHV-xx	4"	DN/NW130CF	96.0
or ICT-CF8"-96.0-40-UHV-xx		DN160/NW150CF	
ICT-CF10"-147.6-40-UHV-xx	6"	DN/NW200CF	147.6
ICT-CF12"-198.4-40-UHV-xx	8"	DN/NW250CF	198.4
ICT-CFXX"-XXX-XX-UHV-5 Vs/C and lower	Axial length H		40.0
ICT-CFXX"-XXX-XX-UHV-10 Vs/C and ICT-CFXX"-XXX-XX-UHV-20 Vs/C**			



TCC+ captured on 2020-07-21 by EN-ACE-CL
Please note that the situation may have changed since the picture was taken

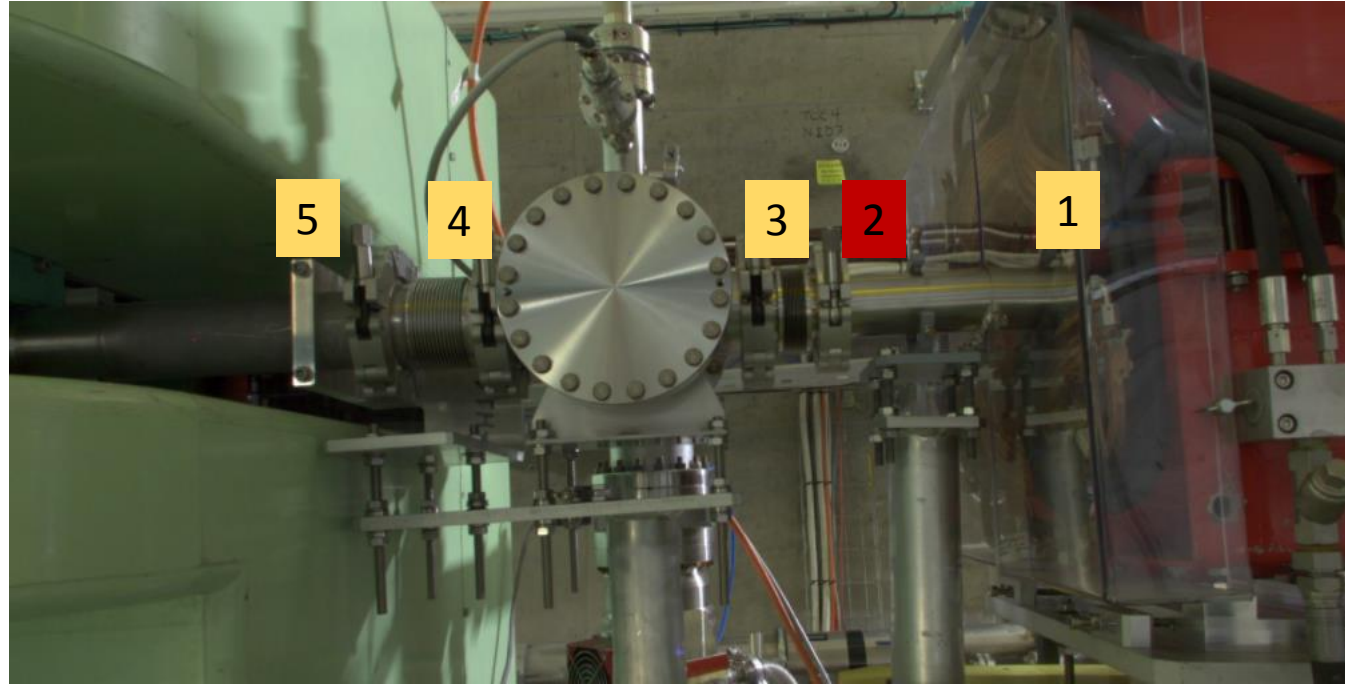
VERSIONS ▾



<https://edms.cern.ch/panoramas/viewer?fov=90.00&id=55299455&lat=-21.60&lon=108.16>



Magnetic measurements



Modulus of magnetic field
Performed by P. Schwarz
with probe Metrolab
model # THM 7025
June 21

I quad [A]	I dipole[A]	Pos 1 [mT]	Pos 2 [mT]	Pos 3[mT]	Pos 4 [mT]	Pos 5 [mT]
360	400	20	2	2	1.5	6
240	275	20	1.7	1.2	1.8	6
120	130	11	0.5	0.2	1.3	3

120% of
operational
values

