

Hall Probe for Magnetic Field Measurements

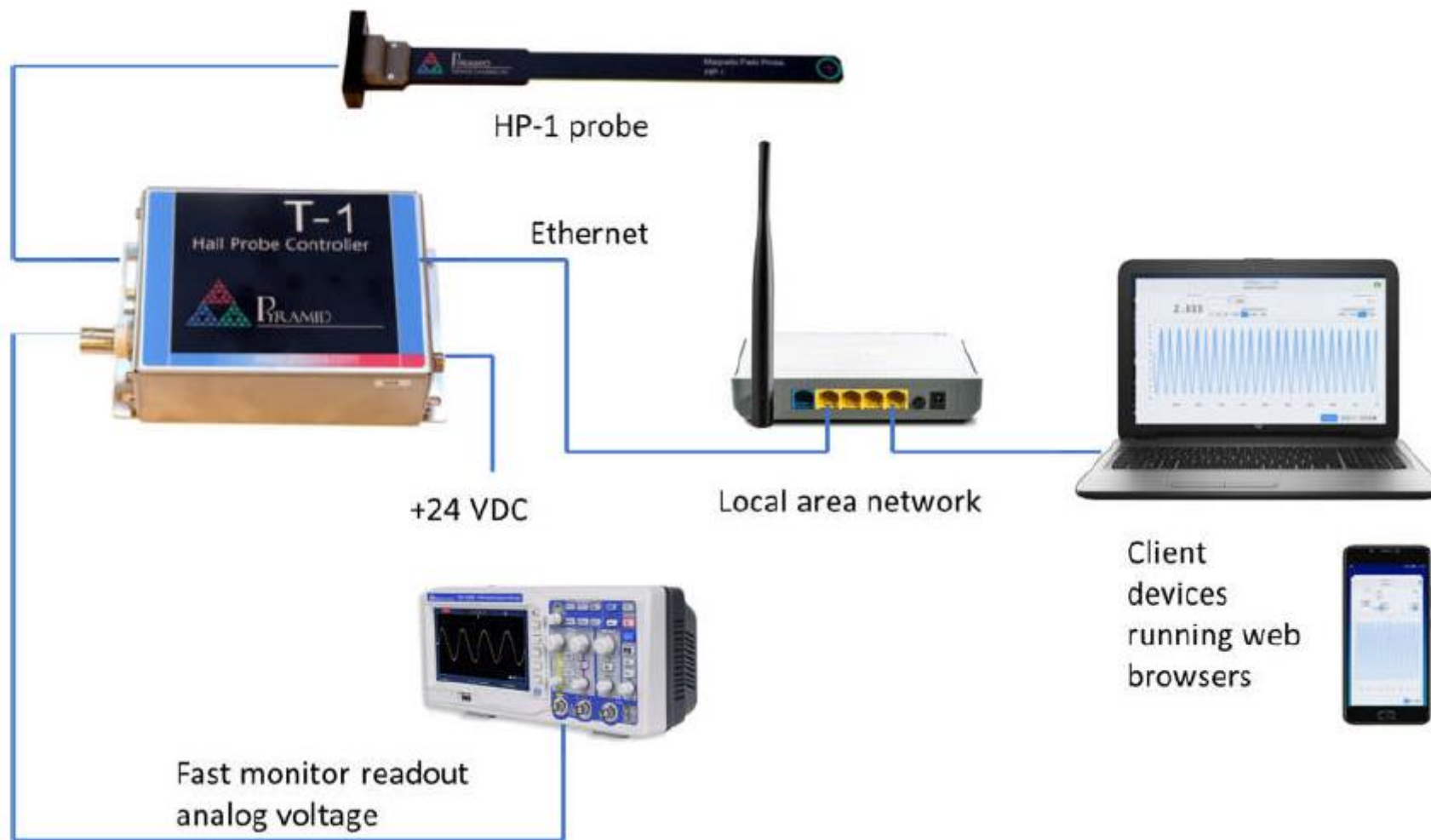
Stan Yen

07 Feb 2023

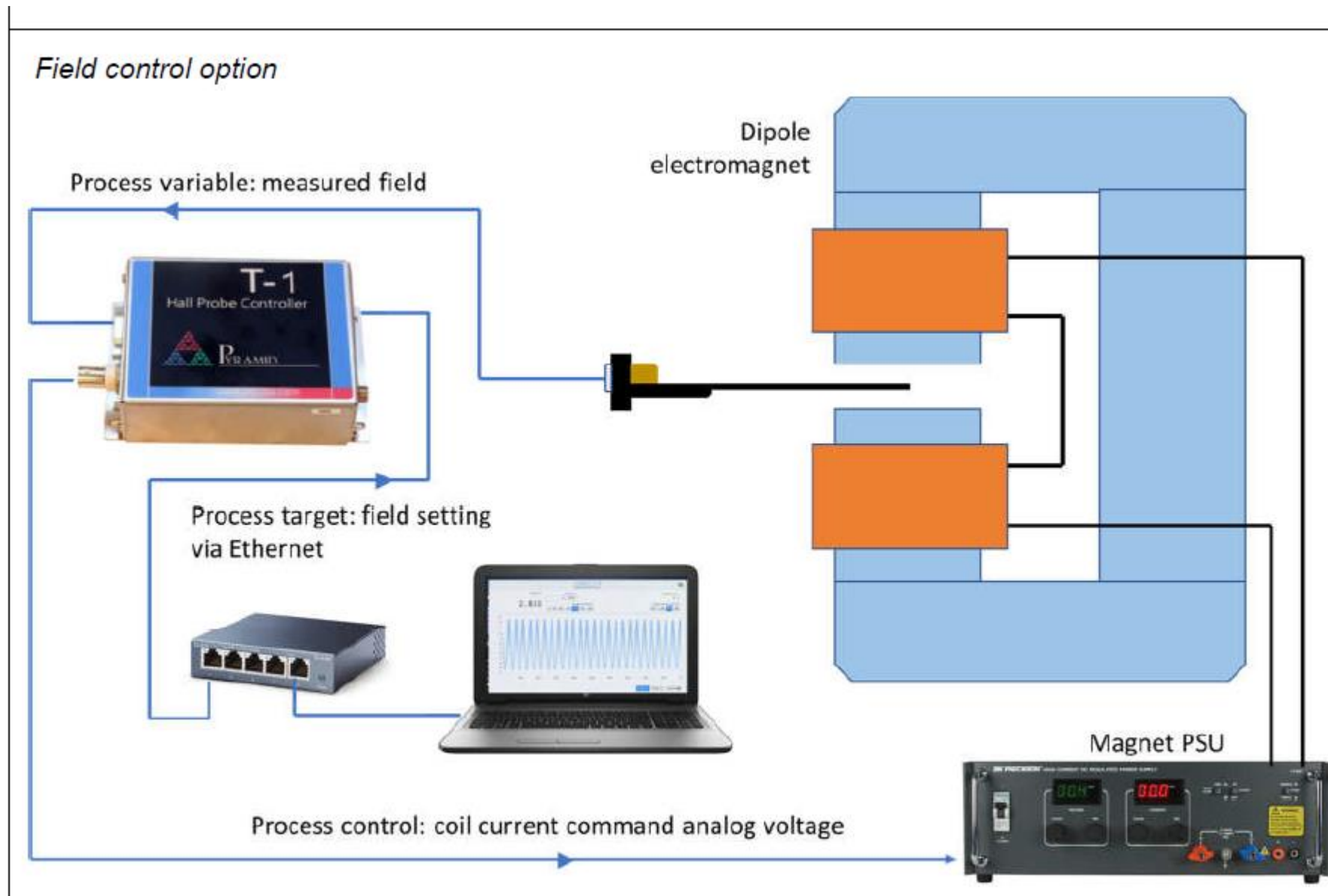


1 mm² active
area of Hall probe

T-1 connected to PC and wireless clients



It is possible to use the Hall probe to provide feedback to control the power supply, but probably not necessary in our case.



Specifications - T1 control unit with HP-1 probe	
<i>Measurement performance</i>	
Measurement ranges	Range 1: +/- 28 kGauss (+/- 2.8 T) Range 2: +/- 7 kGauss (+/- 0.70 T) Range 3: +/- 2.8 kGauss (+/- 0.28 T) Range 4: +/- 0.70 kGauss (+/- 0.07 T)
Measurement rate	25 kHz, 10 kHz, 1 kHz, 100 Hz, 10 Hz, 1 Hz software selectable
Resolution	16 bit ADC with averaging. Range 1: 1.03 Gauss per bit Range 2: 0.26 Gauss per bit Range 3: 0.10 Gauss per bit Range 4: 0.026 Gauss per bit
Noise	Standard deviation of repeat readings at two readout rates at typical measurement field 6.6 kGauss Range 1: 0.55 Gauss at 10 kHz, 0.14 Gauss at 1 kHz, 0.031 Gauss at 10 Hz Range 2: 0.40 Gauss at 10 kHz, 0.079 Gauss at 1 kHz, 0.021 Gauss at 10 Hz.
Calibration	Factory calibration traceable to NMR measurements, stored in HP-1 probe non-volatile memory.
Accuracy	< +/- (0.1% of field + 2.5 Gauss) over 0.0 T to 1.6 T range. Factory calibrated against a reference probe having calibration to < 0.01% error relative to NMR measurement at 1 T.
Linearity	0.05 % maximum deviation relative to full scale of any point from linear fit to at least 10 points over a 10 kGauss span.

For DL we want 1 part
In 1000 reproducibility
For fields of 1.3 kG and
2.1 kG in the dipoles,
So this Hall probe is
sufficiently accurate
and reproducible.

HP1 probe 2D
Drawing.dwg

Save

Show full
drawing

Zoom



Full screen

toggle
background

Measure



Annotation

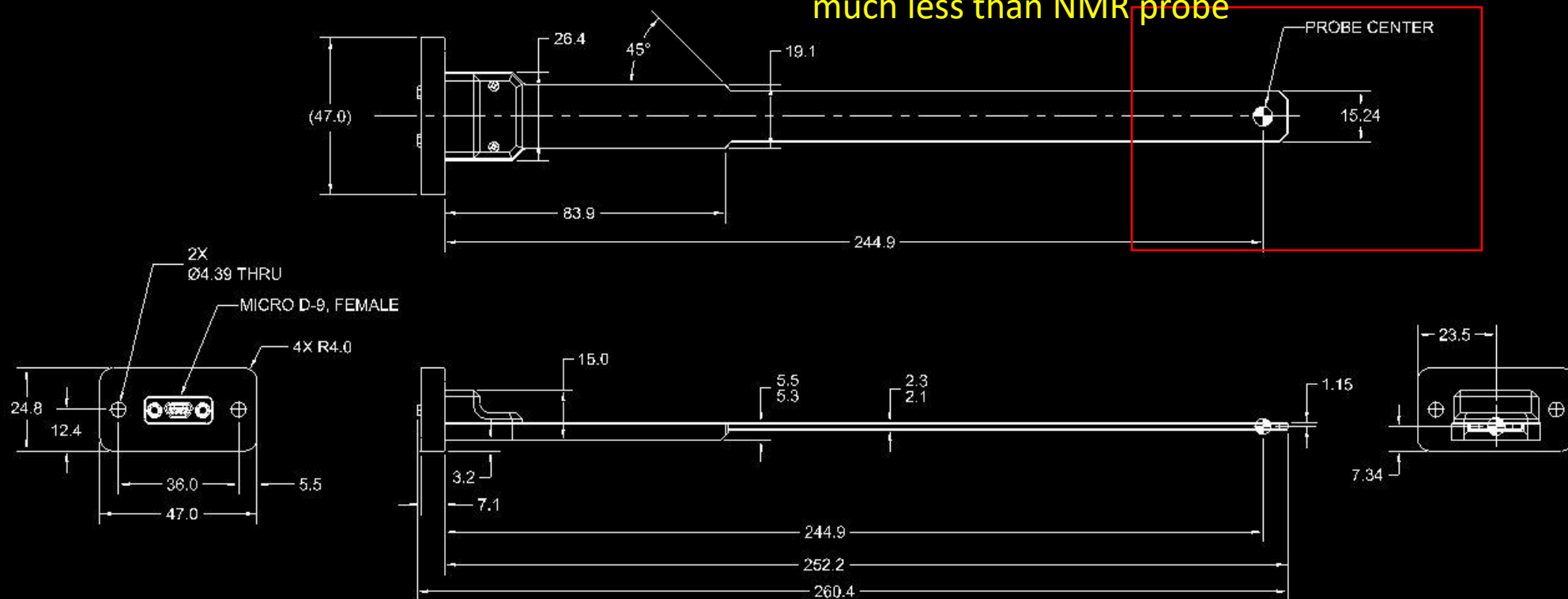
Hide
annotations

Layer



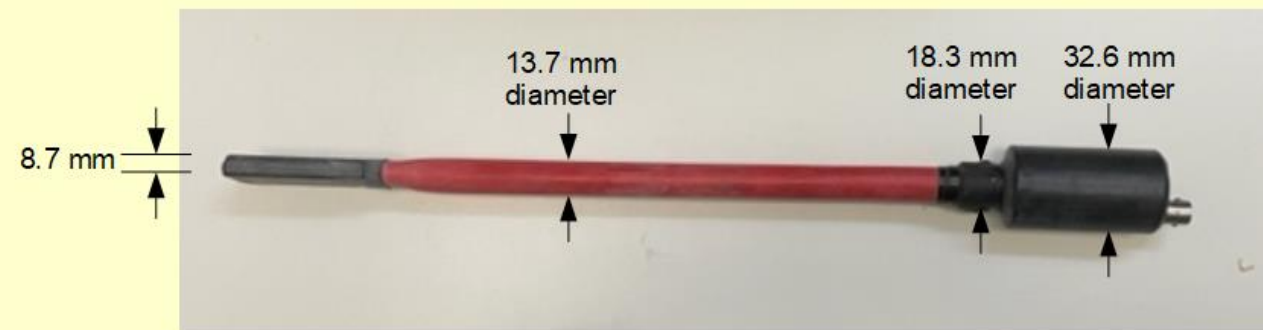
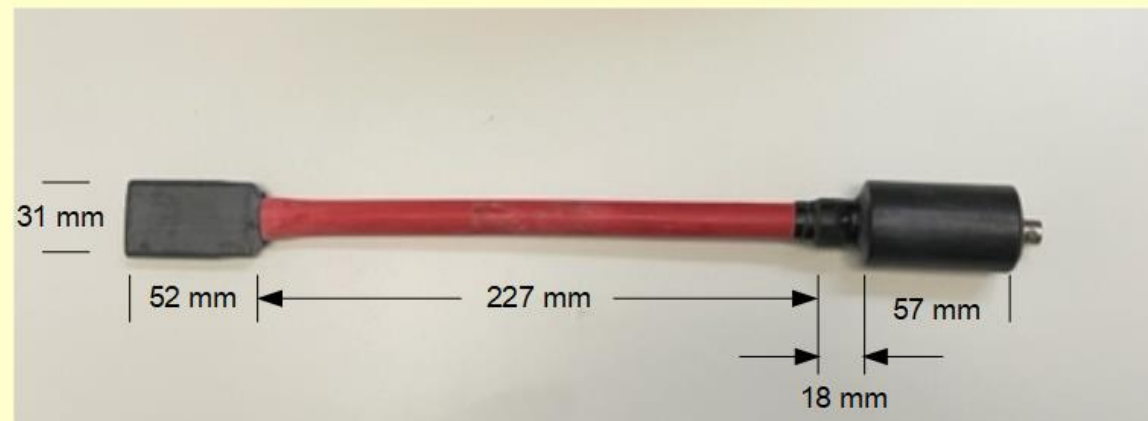
Layout

Probe is 15.24 mm wide x 1.15 mm thick
x 161 mm long - cuts into acceptance
much less than NMR probe



For comparison: the CERN NMR probes are much thicker and wider, and cut more into the acceptance.

Dimensions of NMR Probe #2 (Probe #3 is more or less the same size)



Quoted to:

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Customer ID	Good Thru	Payment Terms	Sales Rep
TRIUMF	28 Feb 2023	Net 30 days	JG

Item	Qty	Description	Unit Price	Extension
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1	1	T1-SYS-6 Precision web-enabled Hall probe system comprising : - HP-1 probe, - T1 control unit, - CAB-T1-6 6' signal cable - PSU24-25-1 universal power supply, IEC C8 inlet - packing and transport case - calibration traceable to NMR - integrated web server - documentation and software <u>Notes:</u> 1) Pricing basis -USD EXW Waltham MA, USA. Payment due at shipment.	\$2,500.00	\$2,500.00
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Cost \$2500 USD
 per unit – probably
 want one for each
 Spectrometer.
 Each comes with
 6 foot cable and
 power supply.