



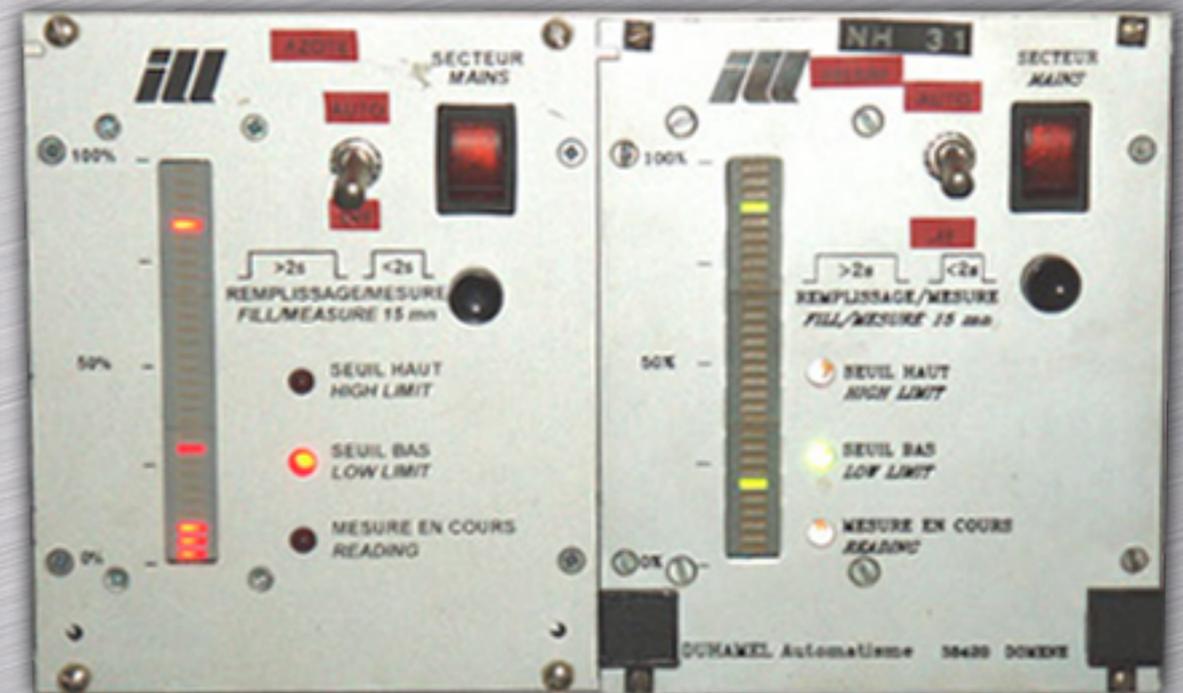
Novel Cryogen Level Monitors

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Duhamel - 1st generation

- since 1987 at ILL
- characteristics:
 - LN₂ or LHe (1 channel)
 - bar graph (red or green)
 - works with ILL sensors
 - very easy to set, control a refill automatically
 - no low-limit alarm for magnets
 - not programmable from a computer, 4-20mA output



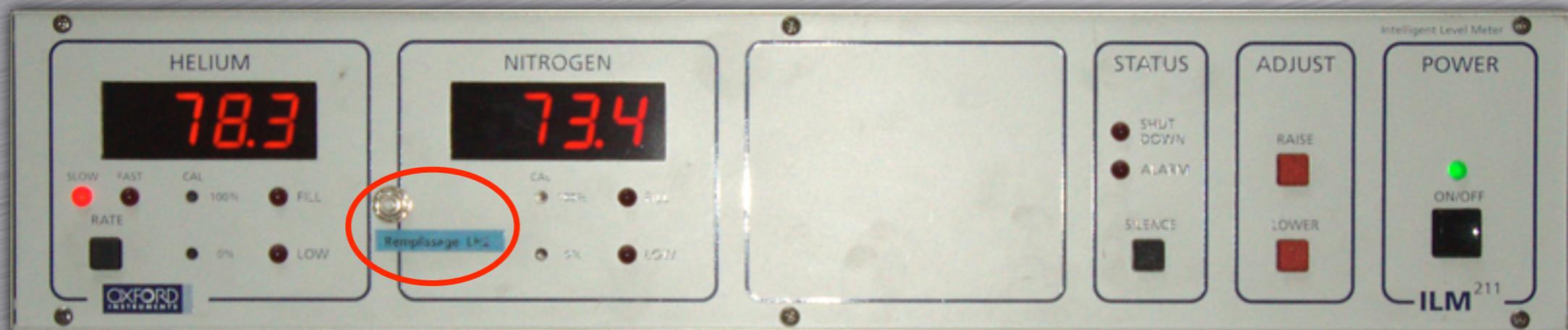
Cryomagnetics - LM500

- since 2000 at ILL
- characteristics:
 - LN₂ and/or LHe (2 channels)
 - low-limit alarm for magnets
 - small-font blue display, 220V → 24V
 - Cryomagnetics/ILL sensors
 - one connector for sensors + digital Input/Output
 - RS232, GPIB, but not fully programmable



Oxford Instruments - ILM 211

- since 1995 at ILL
- characteristics:
 - LN₂ and LHe (2 channels), low-limit alarm for magnets
 - only with OI sensors, no output power control
 - RS232, GPIB, but not fully programmable



Duhamel - 2nd generation

- since 2003 at ILL
- characteristics:
 - LN₂ and/or LHe (2 channels)
 - low-limit alarm for cryomagnets
 - ILL and Oxford Instruments sensors
 - LCD display, slow user interface
 - RS232, but not fully programmable



Duhamel - for LHe Dewars

- since 2005 at ILL
- characteristics:
 - LHe (1 channel)
 - LCD display, slow user interface
 - works with ILL sensors
 - battery level with low-limit alarm
 - long autonomy (about 3 weeks)
 - low power radio system (868MHz)



Next generation ?

- Units tested at ILL are not satisfying.
 - Are there any better units ?
- We propose to build a new generation cryogen level monitor for cryostats:
 - Who should design it ?
 - Who should build it ?
 - With which characteristics ?

Next generation ?

- Ideal characteristics ?
 - 19" rack mountable
 - LN₂ and LHe (2 channels), low-limit alarm for magnets
 - bar graph (or large display with high contrast)
 - ILL, Cryomagnetics, Oxford Instruments,... sensors
 - RS232, GPIB, LXI (LAN successor to GPIB)
 - Fully programmable with cross-platform driver

Next generation ?

- Ideal characteristics ?
 - Main functions launched with button on front panel:
 - measure, refill, stop refill, acknowledge alarm
 - Two modes: manual / auto
 - Automatic calibration from 2 measures or 2 entered values
 - Non-volatile RAM, manages power cuts, robust
 - ...?