

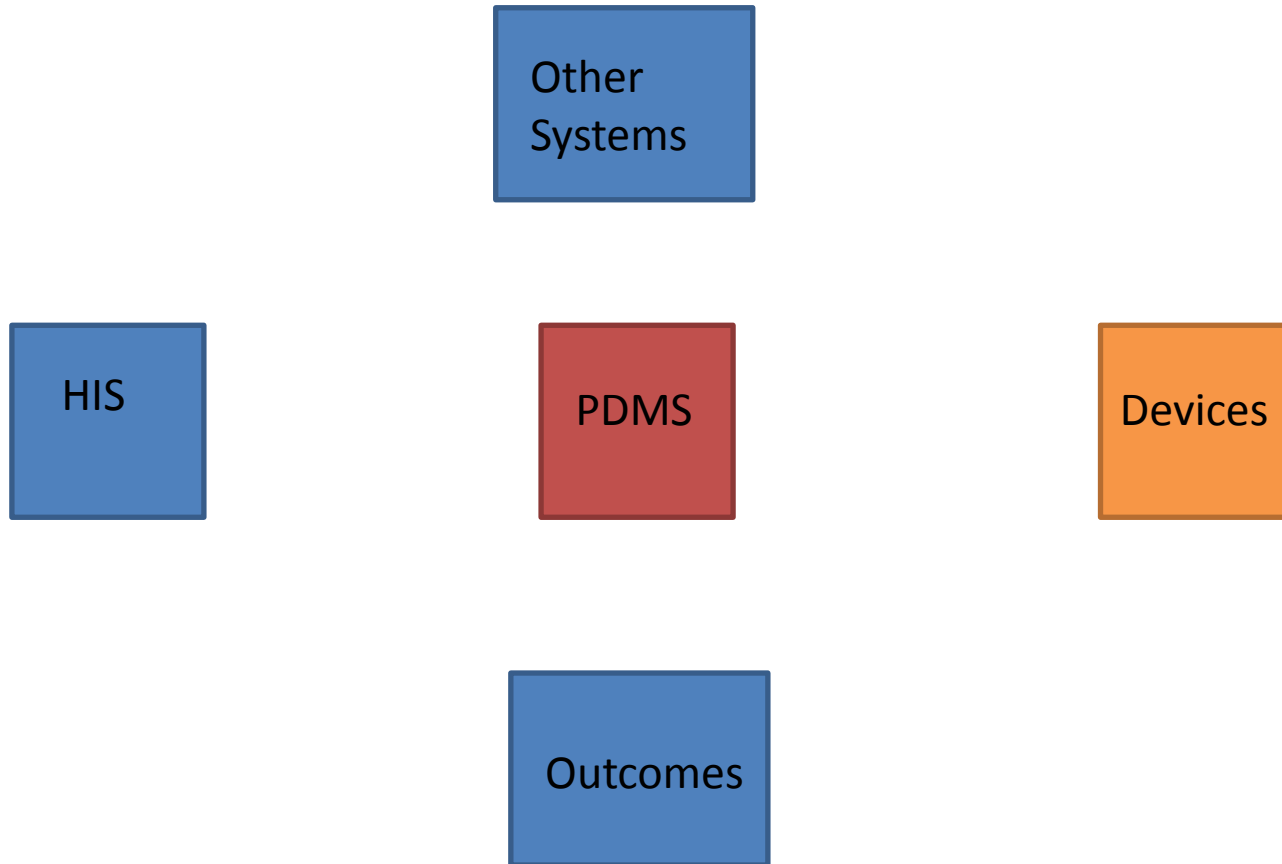




Device data. How important is it?  
The convergence of Physiology and  
data

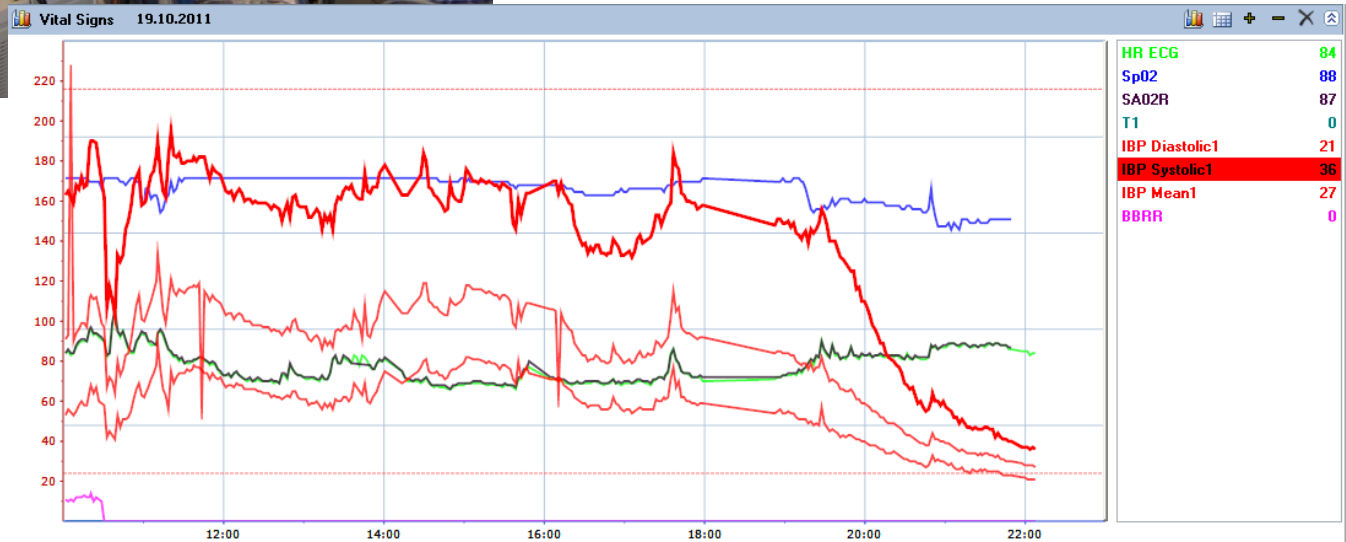
[www.precepthealth.com](http://www.precepthealth.com)

# PDMS. The ham in the sandwich





# MD integration is the convergence of human physiology into real time decision support systems



# Diversity

## Device type

Cardiac perfusion

ECMO

Dialysis

EEG

BIS

Ventilation

Patient monitoring

Medication pumps

## Domain

ICU

Operating theatre

Low acuity ward

Community care

Remote clinics

## Technique

Direct RS232

Server based

Concentrator

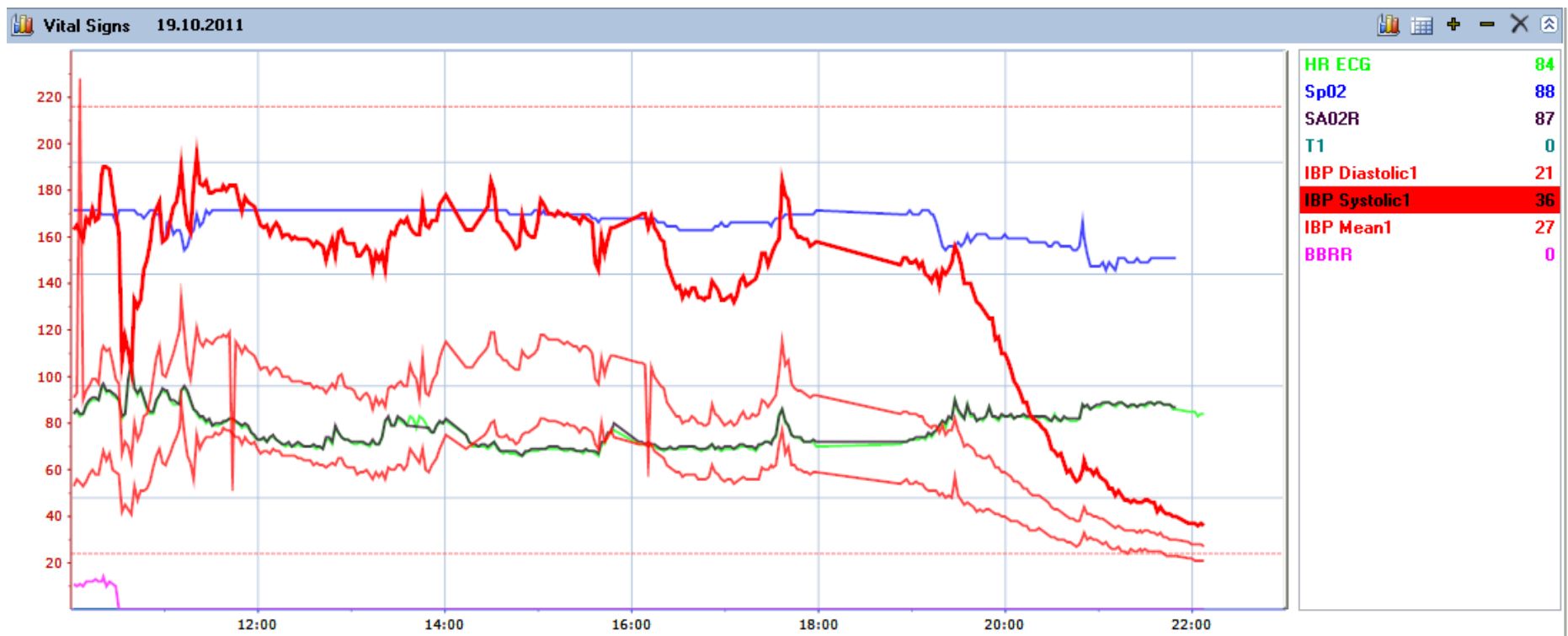
Monitor as a hub



# Data presentation

MD integration is zero value without a presentation layer that delivers clear decision support to clinicians.

We need to think of MD integration and the presentation layer in the same way



MD Integration can provide productivity gains, it can greatly enhance quality of data, it can give you freedom of choice, and it can provide much better decision support.

**The reliability of MD information is essential**

**100% continuity of business must be guaranteed**

- Does the system have a single point of failure ?
- What happens if the infrastructure crashes
- Can the system continue without any infrastructure ?

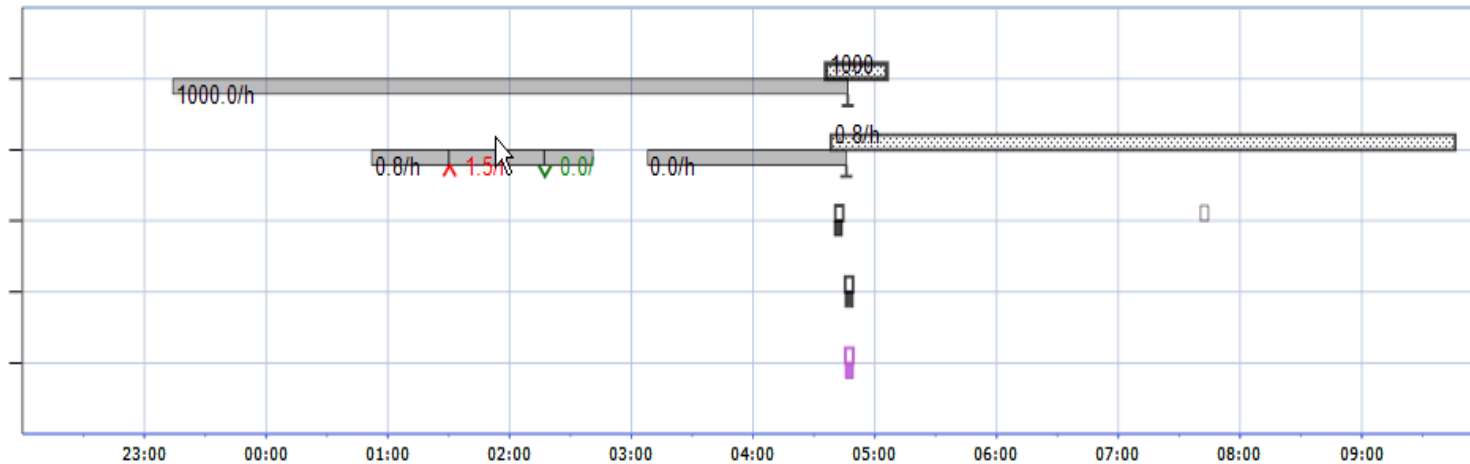


# Integrated medication delivery

- Closed loop or stand alone workflows.
- Safer medication through better patient association
- Automated charting reduces workload and increases accuracy.
- A single cable or Wireless connection tidies up the workplace



Medications 25/10/2011



Hartmann's Solution 500	554...
Noradrenaline Acid Tartr...	1.3
Benzyl Penicillin 5mu	5
Blood	-50
Urine	-100



Precept ICU Care

File View Reports Tools Help

Shift View Chart View Search View

Patient HN **HSAS00071!** Name **HAMSAH BINTI ABDUL HAI** Gender **F** Age **41** Admission **09/07/2011 17:43** Discharge **(none)** HDW1

10/07/2011 - 01/08/2011

Respiratory & Events Haemodynamic Pulse/Blood Pressure Medication ABG & Dextrostic Neurological Images

**Medications 10/07/2011 - 01/08/2011**

**Fluid Balance**

Start Time 01/1  
End Time 30/1  
Ince Midnight Last 24Hr

9% + Dextro 500ml  
Renal (-1805)  
Metronidazo 500mg (+2)  
Inj. Pantoprazole 40mg (+34)  
Inj. Merapenam 1 gm (+351)  
Gastric (-135)  
Blood (-100)  
Urine (-2285)  
Midazolam 15mg/3ml (+1)  
Formula Milk (+750)  
Morphine Sulphate 10mg/n  
Inj. Furosemide:20mg/2ml (+)  
Addamel (+100)  
Bromhexinen (HCl) 4mg/2ml  
Lactulose Syrup (+15)  
Inj. Propofol 1% (0)  
NaCl 0.9% 500ml (0)  
Nourishing Fluid (0)  
-432521382186.5

**NaCl 0.9% + Dextros... 0**

Renal -1805  
Inj. Metronidazole 50... 202  
Inj. Pantoprazole 40... 36  
Inj. Merapenam 1 gm 301  
Gastric -135  
Blood -100  
Urine -2285  
Inj. Metoclopramide ... 102  
Inj. Midazolam 15mg... 0  
Inj. Morphine Sulph... 0  
Formula Milk 100  
Inj. Furosemide 20m... 3  
Addamel 50  
Tab Felodipine 10mg 10  
Inj. Bromhexinen (H... 4  
Lactulose Syrup 15  
Inj. Propofol 1% 0  
NaCl 0.9% 500ml 0  
Nourishing Fluid 0  
Parentrovite 0  
Inj. Cefoperazone 5... 0

**ToolBox**

Infused Medicati... Digital Stop Clock

Page 1

**Event Tree View**

- Admission (09/07/2011 17:43)
  - ENDOTRACHEAL TUBE 7.5 (09/13/2011 23:41 - 13/21/2011 23:41)
  - IPPV (09/07/2011 23:41 - 13/21/2011 23:41)
  - Placed in Bed (10/07/2011 21:13/2011 23:41)
  - NIPPV/BIPAP Mask (13/07/2011 17:50 - 18/27/2011 17:50)
  - ENDOTRACHEAL TUBE 7.5 (15/07/2011 17:50 - 18/27/2011 17:50)
  - IPPV (15/07/2011 17:50 - 18/27/2011 17:50)
  - ENDOTRACHEAL TUBE 7.5 (16/07/2011 17:50 - 18/27/2011 17:50)
  - Endotracheal Tube (16/07/2011 17:50 - 18/27/2011 17:50)
  - Nebulizer (16/07/2011 23:41/2011 23:41)
  - Tracheal Suctioning (16/07/2011 23:41/2011 23:41)
  - ICU Physiology (17/07/2011 17:50 - 18/27/2011 17:50)
  - ENDOTRACHEAL TUBE 7.5 (20/07/2011 17:50 - 27/07/2011 17:50)
  - ENDOTRACHEAL TUBE 2.0 (27/07/2011 17:50 - 27/07/2011 17:50)
  - TRACHEOSTOMY 7.0 (27/07/2011 17:50 - 27/07/2011 17:50)
  - MDI (28/07/2011 00:33/2011 00:33)
  - Chest Physio (28/07/2011 00:33/2011 00:33)

11:45:02

Logged In

Current User: Rohaniza bt. Muhamad

**Medications timeline.** Here we can see a timeline presentation of the medications. This view is easily customized. At the extreme left we can see a summary of the fluids situation. IN the center is the Time line chart showing inflows, injections, and the medications schedule. At the extreme right we can see a hierarchical view of the patents clinical events

- Encapsulating the MD integration layer and isolating it from the presentation layer

## **A distributed processing architecture**

- Fully encapsulated Drivers.
- Battery backup
- Auto device recognition (Plug n play)
- Very low power consumption
- No single point of failure
- Auto update of drivers



The Precept perfusion management system can capture all monitored parameters, alerts, settings, Fluids, Crystalloids, nutrition's, medications, gasses, and any other parameters.

Pump Ass.  
(Heat Ex, Filters,  
Oxygenation



Blood  
Analyzer.



Patient  
Monitor



Syringe Stack

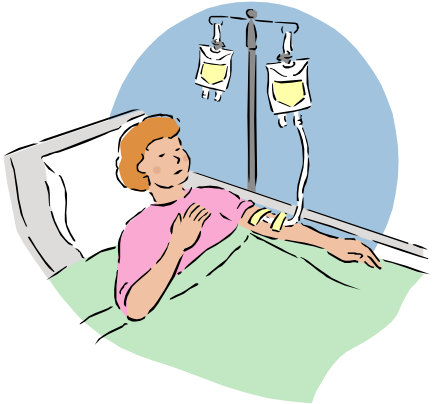


RS232 or Ethernet connections from the devices. Each device has a Precept ID module which delivers a Unique ID for the device, thus enabling linked communications



Precept Health Medical Device Hub with barcode reader for patient lock down

Analogue Inputs



Ether net Network . TCP or UDP Packet s



Software application running at the ECMO frame, at the nurse station, and in the Doctors office or other locations will display of live data

Server





# ECMO



Terumo SDI 500 Blood Monitoring System

Precept 'Smart Dongles' for MDH

Draeger Monitor (not pictured – to be added)

Alaris Syringe Pump

Data Analysis Suite (to be bracket mounted)

Medical Device Hub (to be bracket -mounted)

Stockert S5 Pump

Maquet Rotaflow (not pictured – to be added)

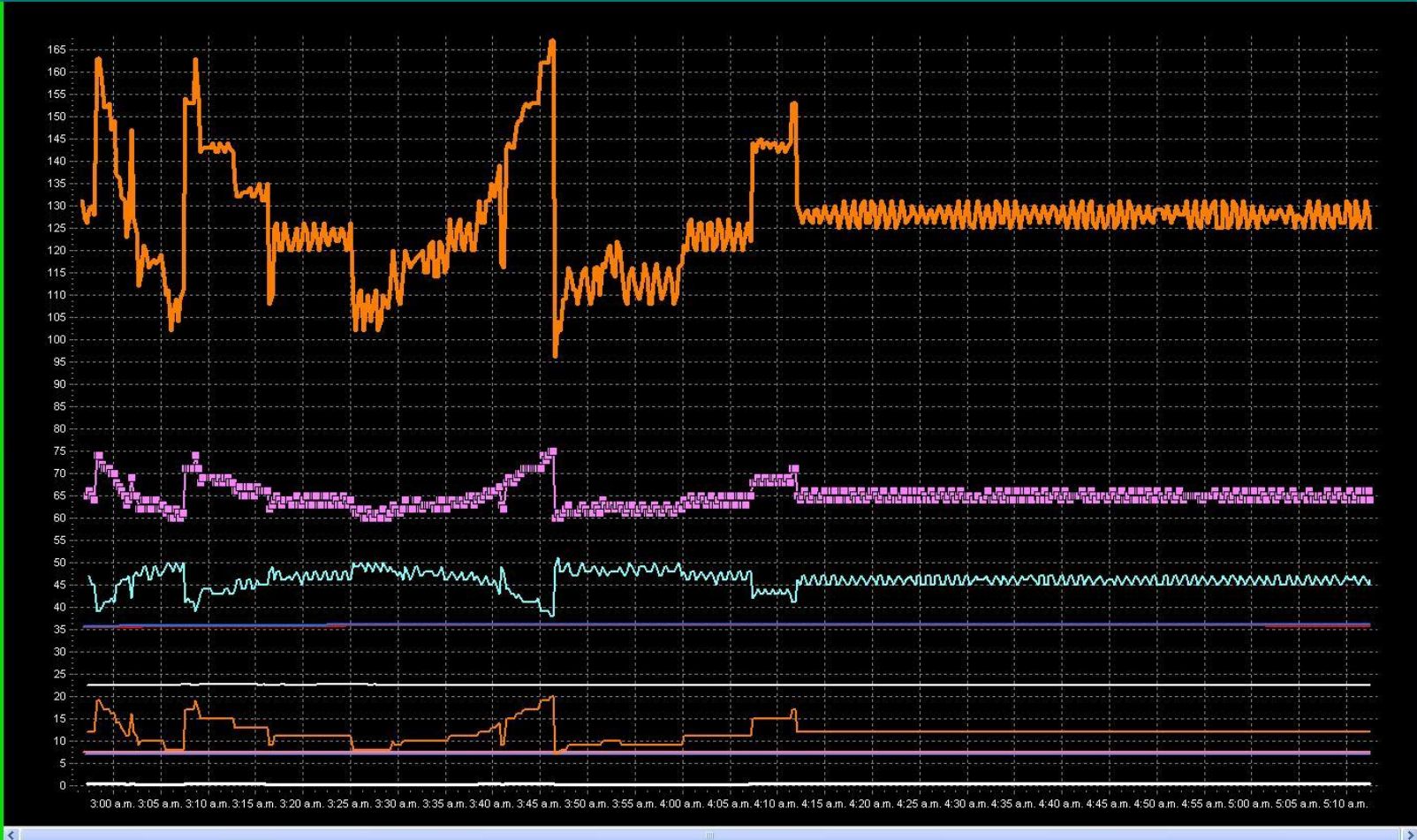
P HR **0** b/min NIBP **0/0** mm/hg SPO2 **0** %

Use zero values  mean

Recurse Dataset

Momer Param	Unit	Value	ID
05:12 T-Art	°C	35.7	35.7
05:12 T-Ven	°C	36	36
05:12 PH art T	ph	7.44	7.44
05:12 PH ven T	ph	7.03	7.03
05:12 Pre Memb Pre	mmHg	125	125
05:12 HLMFLOW	l/min	0.31	0.31
05:12 HLM RPM	rpm	12	12
05:12 REALTIME	ms	36807	36807
05:12 TEMP	°C	22.5	22.5
05:12 Post Mem	mmHg	64	64
05:12 Blad press	mmHg	46	46
05:12 TIMER4	sec	900	900
05:12 TIMER5	sec	120	120
05:12 TIMER6	sec	120	120
04:56 BUBBLE	mmol	22.5	22.5

- Pre Memb Press
- T-Art
- T-Ven
- PH art T
- PH ven T
- HLMFLOW
- HLM RPM
- TEMP
- Post Mem
- Blad press



# Chart

Real time charting. Users can design their own charts and feed them in real time from a 300+ vendor device election, or from an HL7 data feed.

