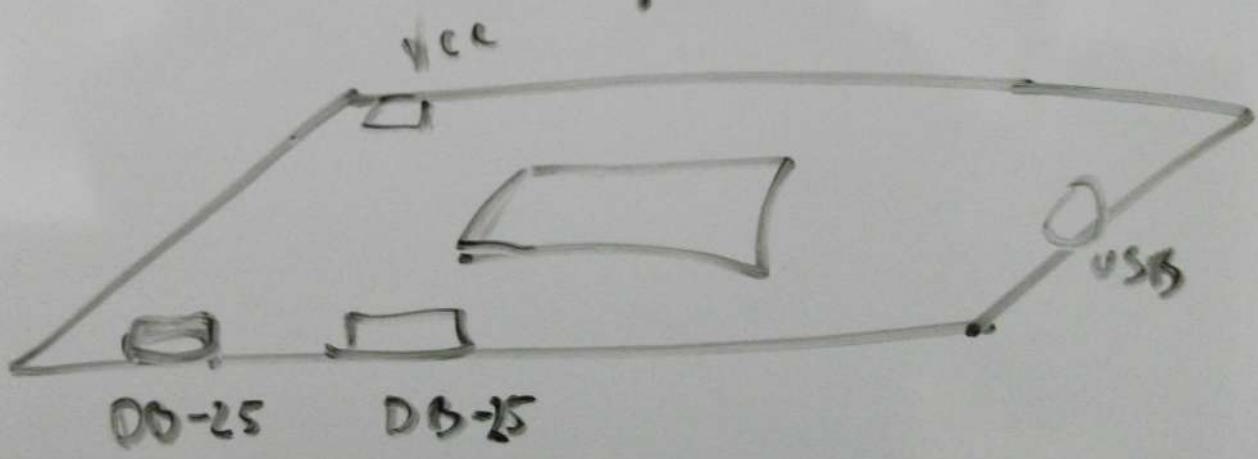
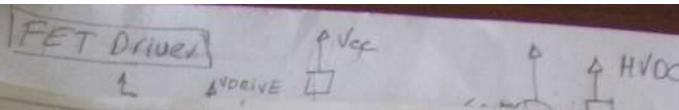


HW



	H/W / SW	
USB	✓	✗
GPIB	✗	✗
CAN	✗	✗

ENR



CIRCUIT BOARD Power Supply module

①

(XR76205) | 40V 5A Synch step down | $V_{IN} = 40V$
integrate switch + Power good

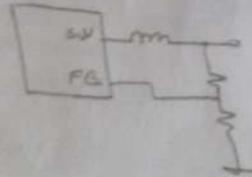
(SPX29300) | LDO 3.0A $V_{IN} = 16V$ $V_{DROP} = 0.6V$ Adj?

(SPX29150/S1/S2/S3) | LDO 1.5A $V_{IN} = 16V$ $V_{DROP} = 0.39V$

(SPX3819) | LDO 0.5A $V_{IN} = 16V$ $V_{DROP} = 16V$

(SPX2815) | LDO 1.5A $V_{IN} = 10V$ $V_{DROP} = 1.1V$

(SPX1117) | LDO 0.8A $V_{IN} = 20V$ $V_{DROP} = 1.1V$



(SP34063A) | Buck Boost Inverting LSA $V_{IN} = 36V$

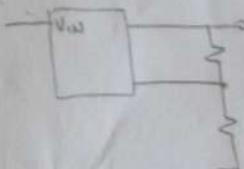
(SP6134) | PWM step down controller synch 600KHz | $V_{IN} = 28V$

(XR77103) | Universal PMIC | 3 output buck regulator | $V_{IN} = 14V$

(XR77129) | Universal PMIC | 40V PWM | 3 output 0-5V

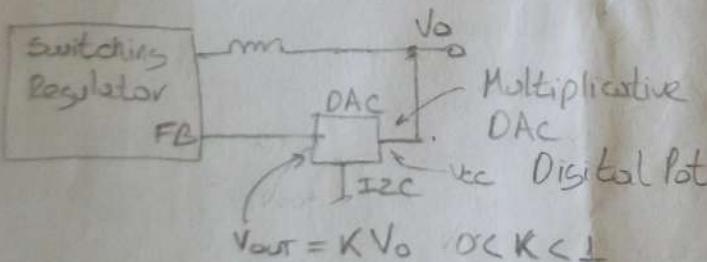
(XR79110) | 22V LDO | Synch step down COT power module

integrated switch | integrated inductor



TL494 SOIC

Programmable power supply



PIC18F45K50

PORT B 8 { AN 12-13 | SDI SDO SCL SDA { SPI I2C } INT0 INT1 INT2 }

PORT A 8 { AN 2-9

PORT C 5 { AN | D+ D- { USB }

PORT D 8 { AN ?

Digital Pot

CAT 5132 ON SEMI

MAX5482 Maxim

MCP 4161 Microchip

MPL3115A2 I2C pressure sens
+ temp

S17020 I2C Humidity sens

S17050 I2C

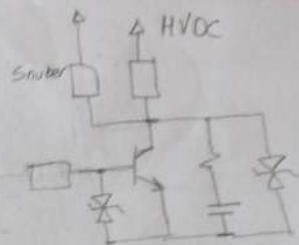
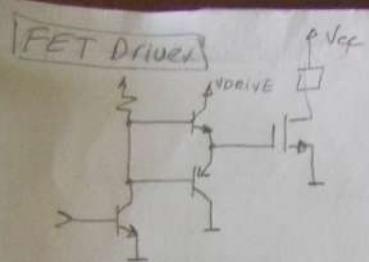
FXOS8700 Accelerometer
6 axis SPI/I2C

S17021 I2C Humidity/Temp

S17053 I2C Temp

S17210 Hall effect position/sensor/Temp

S17214 Field hall effect



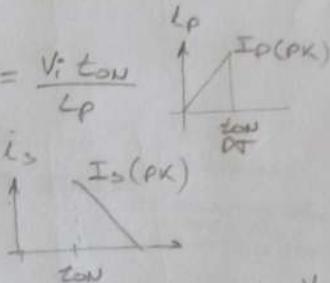
①

Flujo Back/Forward -> modos continuo-discontinuo - depende de corriente magnetización! **Discontinuo**

Fase 1 QL ON

$$V_i = L_p \frac{dI_p}{dt} \rightarrow I_p = \frac{V_i t_{ON}}{L_p}$$

$$I_p(PK) = \frac{V_i D T}{L}$$

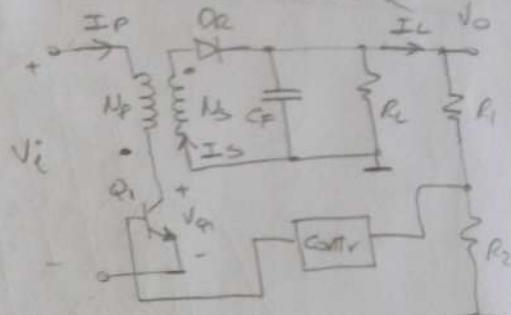


Fase 2 QL OFF

$$I_s(PK) = \frac{N_p I_p(PK)}{N_s}$$

Potencia extraída Fase 1

$$P_{IN} = \frac{1}{2} L_p \frac{I_p^2}{T} \rightarrow P_{IN} = \frac{1}{2} L_p \left(\frac{V_i t_{ON}}{L_p} \right)^2 = \frac{1}{2} \frac{(V_i t_{ON})^2}{L_p T}$$



Potencia de salida Fase 2

$$P_o = N_p P_{IN} = N_p \left(\frac{V_i t_{ON}}{L_p} \right)^2 = \frac{V_o^2}{R_L} \quad \eta: \text{efficiency} \rightarrow V_o = \sqrt{\frac{P_o R_L}{2 L_p T}} V_i t_{ON}$$

$$V_o = V_i D \sqrt{\frac{P_o R_L T}{2 L_p}}$$

Volt max en QL al final fase 2

$$V_{QL(max)} = V_c(max) + \frac{N_p}{N_s} V_o$$

Para V_o constante se debe tener $V_i t_{ON} = \text{constante}$

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Conditions in hard copy have been sent to you, will be sent to you at your request. These terms and conditions deposited at the Commercial Registry of Rotterdam and published at Seller's public website

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ICs SWITCHING CONTROLLERS

Flyback Discont

Corriente pico primaria de $P_o \rightarrow I_p = \frac{V_{i\text{TON}}}{L_p} \rightarrow P_o = \eta \frac{(V_{i\text{TON}})^2}{2T L_p}$ (1)

$$P_o = \eta \frac{V_{i\text{TON}} I_p}{2T} = \frac{V_o^2}{R_L} \rightarrow I_p(\text{pk}) = \frac{2T V_o^2}{R_i V_{i\text{TON}} R_L} \rightarrow I_p(\text{pk}) = \frac{2V_o^2}{\eta D R_L V_i}$$

$$I_p(\text{pk}) = \frac{2 P_o}{\eta D V_i}$$

corriente max en Q_1

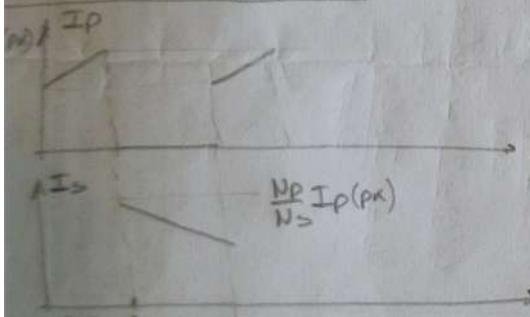
$$I_{Q1}(\text{max}) = I_p(\text{pk})$$

→ V_o se mantiene constante al mantener $V_{i\text{TON}}$ constante

Para $V_{i\text{TON}} = \text{cte}$ para un V_o dado. Con $V_i(\text{min}) \rightarrow t_{\text{ON}}(\text{max})$ entonces D_{MAX} con $V_i(\text{min})$ para un V_o dado

$$D_{\text{MAX}} = \frac{V_o}{V_i(\text{min})} \sqrt{\frac{2 L_p}{R_i R_L T}}$$

Flyback continuo



$$\text{Al final de } Q_1 \text{ ON} \quad I_p(\text{pk}) = I_p(0) + \frac{V_i DT}{L_p} \rightarrow \text{si } I_p(0) \gg \frac{V_i DT}{L_p} \rightarrow I_p(\text{pk}) \approx I_p(0)$$

$$I_s(\text{pk}) = \frac{N_p}{N_s} I_p(\text{pk}) = \frac{N_p}{N_s} \left(I_p(0) + \frac{V_i DT}{L_p} \right) \approx \frac{N_p}{N_s} I_p(0)$$

$$I_s \text{ decrece} \rightarrow -V_o = L_s \frac{dI_s}{dt} \rightarrow \frac{dI_s}{dt} = -\frac{V_o}{L_s} \rightarrow I_s(t) = I_s(\text{pk}) - \frac{V_o t}{L_s}$$

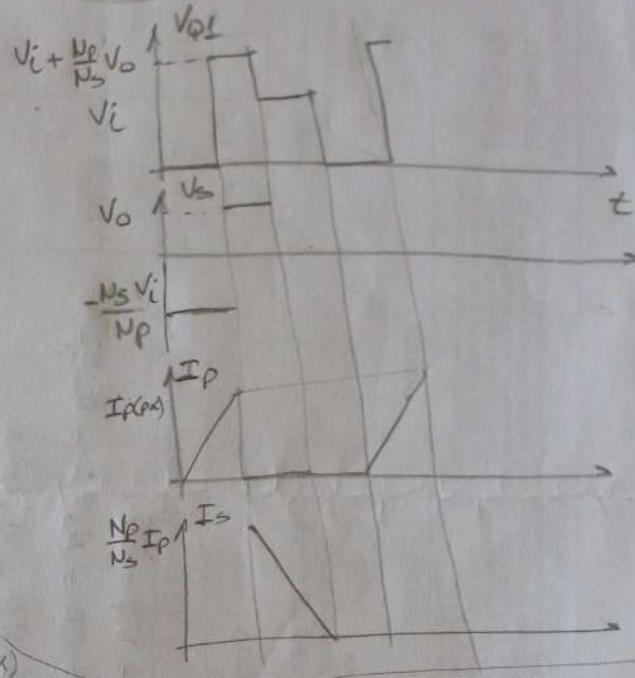
Potencia de salida $P_o = V_o I_s(t)$ desde t_1 a t_2

$$P_o = V_o I_s \frac{T - t_{\text{ON}}}{T} \quad I_s \text{ promedio} \approx I_s(\text{pk}) \rightarrow P_o \approx V_o I_s(\text{pk}) \frac{T - t_{\text{ON}}}{T}$$

$$I_s(\text{pk}) = \frac{P_o}{V_o (1 - \frac{t_{\text{ON}}}{T})} \quad \text{La potencia entrada } P_{IN} = \frac{P_o}{\eta} \rightarrow \eta: \text{eficiencia}$$

$$P_{IN} = V_i I_p \frac{T - t_{\text{ON}}}{T} \approx V_i I_p(\text{pk}) \frac{T - t_{\text{ON}}}{T} = \frac{P_o}{\eta}$$

$$I_p(\text{pk}) = \frac{P_o}{R_i V_i \frac{T - t_{\text{ON}}}{T}}$$



TCM SWITCHING CONTROLLERS

1100 = 111001 Transistor

.. 111001 (IM 3524)

Flyback continuo

$$\text{Calcub } V_o \rightarrow P_{IN} = \frac{P_o}{\eta} \rightarrow V_i I_p(PK) \frac{t_{ON}}{T} = \frac{L}{\eta} V_o I_s(PK) \frac{T-t_{ON}}{T} \quad (2)$$

$$V_o = \frac{V_i \frac{t_{ON}}{T} I_p(PK) N_p}{T - t_{ON} I_s(PK)} \rightarrow \boxed{\frac{N_p D V_i N_s}{L - D N_p} = V_o} \rightarrow V_o = \left(\frac{N_s}{N_p} \right) \frac{D_{MAX} V_i (min)}{L - D_{MAX}}$$

Para $V_o = \text{ctle} \rightarrow DV_i = \text{ctle} \rightarrow \text{cuando } V_i(\text{min}) \rightarrow D_{MAX}$

$$\text{Max corriente } Q_1 \quad I_{C1(\text{max})} = I_p(PK) = \frac{P_o}{\eta V_i D_{MAX}} \quad (?)$$

$$\text{Max voltage en } Q_1 \quad V_{Q1(\text{max})} = V_i(\text{max}) + \frac{N_p}{N_s} V_o$$

En la transición de continuo a discontinuo, los valores de $V_o(\text{disc})$ y $V_o(\text{cont})$ son IGUALES

$$V_o(\text{disc}) = V_o(\text{cont}) \rightarrow V_i(\text{min}) D_{MAX} \sqrt{\frac{R_{RL} T}{2 L_p}} = \frac{N_s}{N_p} \frac{D_{MAX}}{L - D_{MAX}} V_i(\text{min})$$

$$\text{Resolviendo para } L_p \rightarrow L_p(\text{limit}) = \frac{1}{2\eta} T R_{RL} \left[(L - D_{MAX}) \frac{N_p}{N_s} \right]^2$$

$$L_p(\text{limit}) = \frac{1}{2\eta} T \frac{V_o^2}{P_o} \left[(L - D_{MAX}) \frac{N_p}{N_s} \right]^2 \xrightarrow[V_o]{\text{reemplaza}} L_p(\text{limit}) = \frac{1}{2} R T \frac{P_{MAX}^2 V_i^2 (\text{min})}{P_o}$$

Para un $V_i(\text{min}) D_{MAX}$ dados si $L_p < L_p(\text{limit})$ el circuito es DISCONT

Flyback transformer \rightarrow Unidirectional BH \rightarrow air gap

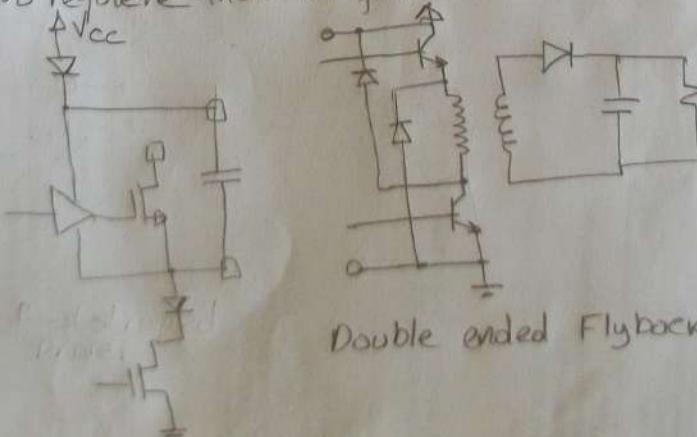
Continuo \rightarrow mayor potencia para la misma $I_p(PK)$

Una gran $I_p(PK)$ \rightarrow spike transitorio en OFF

Discontinuo \rightarrow Inductancia magnetización menor \rightarrow respuesta rápida

Continuo \rightarrow Tiene un coro en plano doblecho \rightarrow difícil control

Flyback $< 100W \rightarrow$ No requiere inductor filtro salida

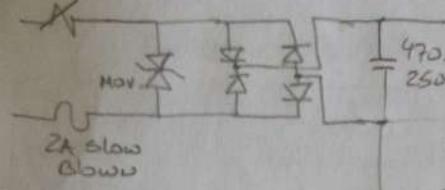


ICs SWITCHING CONTROLLERS

... A.L. Hall (LM2524)

(AN25 LINEAR TECHNOLOGY)

Ther



Fly back

Transistor

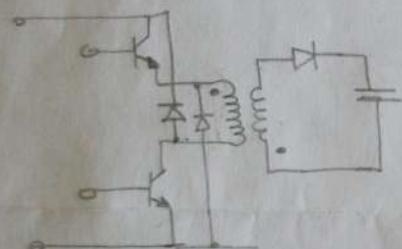
400V @ 110V mains

800V @ 220V

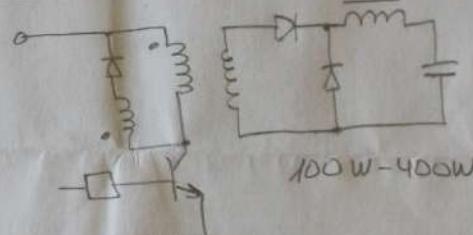
Schottky diodes for <20V

Fast Recovery for >20V

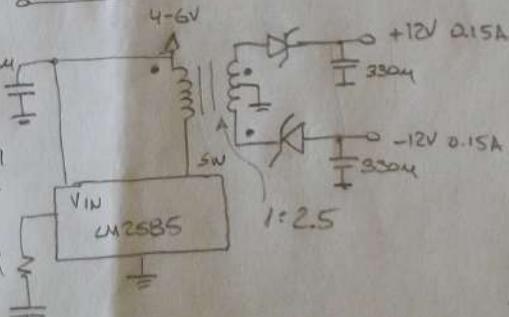
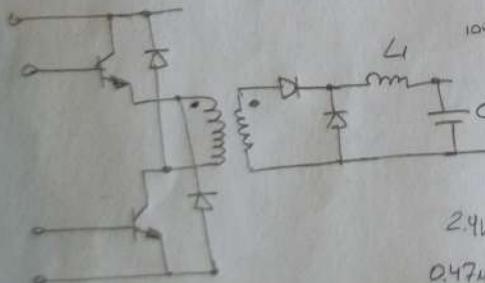
Two transistor Flyback



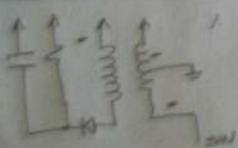
Forward Converter



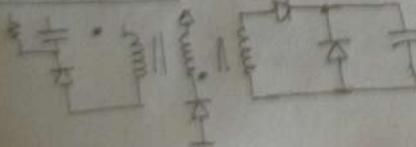
Two transistor forward



Snubber Circuit

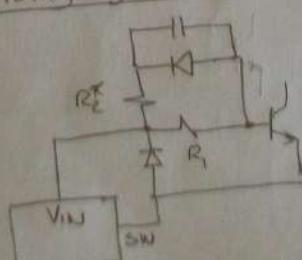
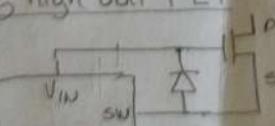


Forward Converter



Linear Technology AN25

Driving high volt FET



Driving high volt NPN

ICs SWITCHING CONTROLLERS

CENDIT 11713 Perifericos

(MPL3115) Sensor presión I2C (SI7053) Sensor de temperatura I2C

(SI7021) Sensor humedad/temp

(MC33996) 16 bit switch driver SOPWR (max 20V) V_{DNR}(max 50V)

switch tactil (1-1825910-5) Conn Recept (535542-B) 8x2

Conn Recip (535541-6) 8x1 Switch tact SMDA 12V FSMIJM62BW04

Power Led AN1610P112R04 (1) Tact THT FSMIJ62BW04
Switch ni cold W

RJ45 Jack int mag 10/100 2301994-3

RJ45 Jack INT Mos 1G (1-2301994-1)

Button Cap (2311403-3)

Tact THT cold W FSMIJ65AW04

Pin header power 8P 3.5 (1986717-8)

Conn housing 24P 1-87456-9

Term block 8P 3.5mm

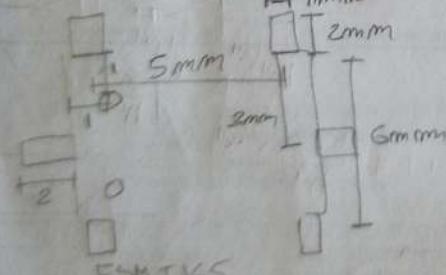
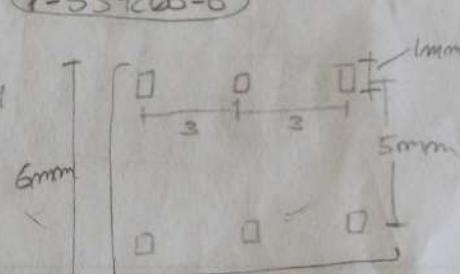
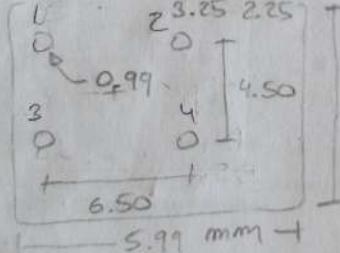
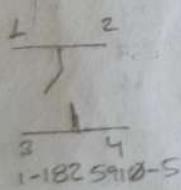
Female

power male (1776134-8)

Conn header (6-102618-0)
vert male 24P

22x2 Vert Conn 0.1
female

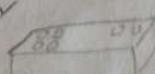
16x2 Vert conn 0.1
(1-534998-2)



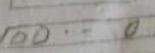
FSMIJ62BW04

Receptaculo pin header

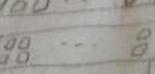
535542-B 16P (8x2)



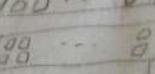
535541-6 8P (8x1)



1-534998-2 44P (22x2)



1-534206-6 32P (16x2)



HogJack 100BT J1012FZ1CNL

XFRMR Flyback PA3965D02NL

HogJack 100BT JXK10-0190NL

XFRMR Flyback PA2653NL (250VAC)

HogJack 100BT JP0118Z1UNL

XFRMR Flyback PA3855.003NL (57V)

XFRMR Flyback PA1297NL (380V)

ICs SWITCHING CONTROLLERS

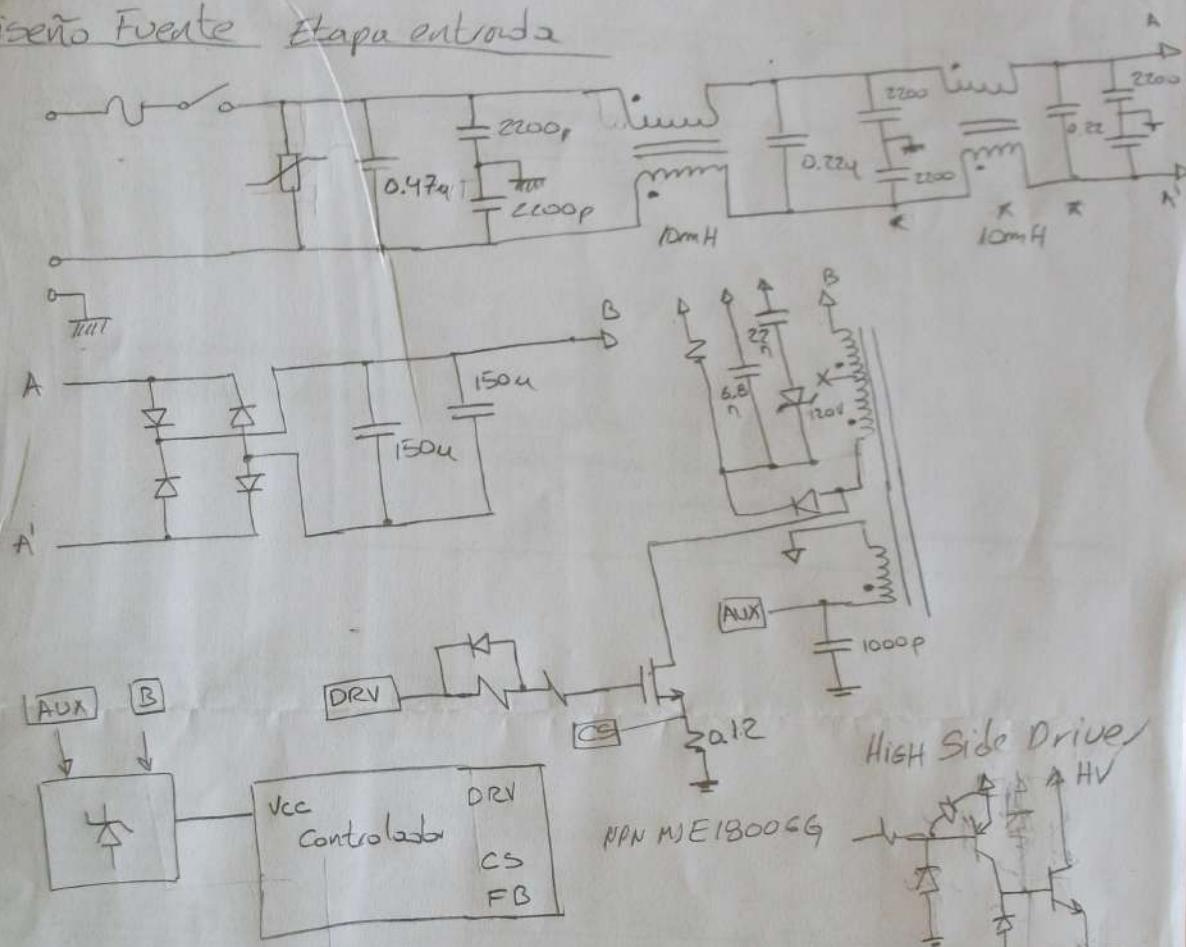
(TL2575) HV-12V

UC3823 PWM Controller

UH 3524

(TL494) KA7500B

Diseño Fuente Etapa entrada



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CENDIT 11713

Versión Reducida (Buses)



Opciones buses

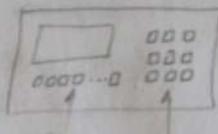
① Teclado bus paralelo: Numerico $3 \times 4 = 12$ botones $\rightarrow 7$ líneas

17 botones $\rightarrow 4 \times 5 \rightarrow 9$ líneas, 20B

24 botones $\rightarrow 6 \times 4 \rightarrow 10$ líneas

32 botones $\rightarrow 6 \times 6 \rightarrow 12$ líneas, 36B

64 botones $\rightarrow 8 \times 8 \rightarrow 16$ líneas,



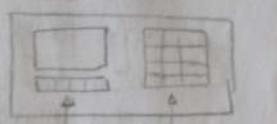
Teclado QWERTY $\rightarrow 37$ teclas

Alfa + Num

$6 \times 7 \rightarrow 13$ líneas

27 alfa

10 num



8B 16B (24B)
5B 16B (21B)
16B 16B (32B)

② Controlador teclados serial SPI

I2C

MOSI, MISO, CLK, RESET, INT $\rightarrow 5$ líneas
VCC, GND $\rightarrow 2$ líneas

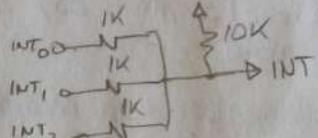
SDA SCLK RESET INT $\rightarrow 4$ líneas } 6
VCC GND $\rightarrow 2$ líneas } líneas

③ Controlador Puertos Viking

Shared Interrupt

Serial

Opción 1 SPI \rightarrow MOSI, MISO, CLK, RESET } 6 líneas
VCC, GND



Opción 2 SHIFT REGISTER / POWER LOGIC

SCLK, RCLK, SDATA, RESET } 6 líneas
VCC, GND

④ PANTALLA LCD / TACTIL

Opción 1: Paralelo

Datos + Control

8 bits datos

WR RD CS RESET CD Scontrol

} 13 líneas

Opción 2: Serial SPI

MOSI, MISO, CLK, RESET } 6 líneas
VCC, GND

Opción 3 I2C

SDA, SCLK, RESET, VCC, GND 5 líneas

BUSES seriales SPI + I2C combinados

MOSI MISO SCLK RESET INT GND AO AL \rightarrow SPI
SDA CLK RESET INT GND AO AL $\underbrace{\text{Direccion}}$ \rightarrow I2C

Función



1000 NORTH MAIN STREET
MANSFIELD, TX 76063
silabs@supplier-direct.com

DHL TRACKING NO.	
9025895174	
INVOICE NO.	INVOICE DATE
45077445	08/10/17
CUSTOMER P.O. NUMBER	
SL16331	

CERTIFICATE OF ORIGIN

PART NUMBER	CUSTOMER PART NUMBER	HTS NUMBER	COUNTRY
571CDC001847DG <u>Conectores disponibles</u> Sata horz 22P Sata horz 13P Sata vert 13P Sata horz 16P Sata horz 16P Bloque 16P 2row 8P 2.5mm Bloque 12P 2row 8P 2.5mm Conector mini 20P 2row 10P Horz right angle (rojo) Conector mini 20P 2row Vertical Conector mini 20P 2row cable Conector 40P receptacle 2row 22P vertical Conector 40P plus 2rows 22P vertical SATA 1row 18 } 1row 13 } 31P right angle	CONN SEC II 12 Pos (2.5mm) Receptacle vert (2.10) 2rows CONN CARD EDGE 36 Pos (2.54mm) Vert 2rows CONN SEC II 10 Pos 2rows AMP DUOPLUG 14P WIRE-BOARD 2.5mm DUOPLUG 8P WIRE-BOARD 2.5mm <u>PIC Disponibles</u> PIC16F876/877 PIC16F84 PIC18F458 PIC18F433 PIC16F747 PIC18F122 1320 PIC18F4455 PIC16F627 PIC12G29	8542.31.0001	TW

BLANKET PERIOD

None - single shipment inv. # 045077445

FROM: _____

TO: _____

Paul Sherry

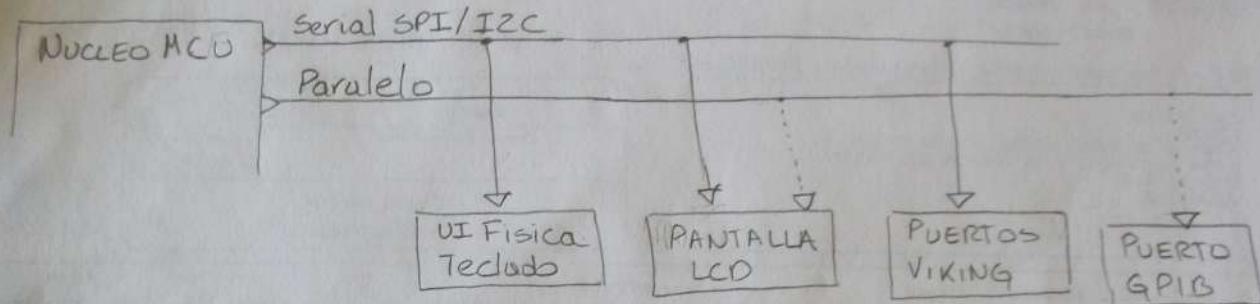
Silicon Laboratories

08/10/17

JAVA FX BINDINGS

CENDIT 11713 } Version reducida

BUSES: Paralelo + Serial



CONTROLADOR TECLADO

Microcontrolador 16p + 8p → al menos 24 pines

CONTROLADOR PANTALLA → Pantalla SPI

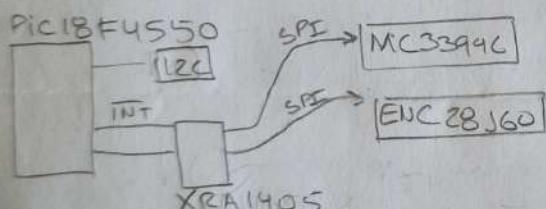
Microcontrolador 8 datos + 5 control + 8 serial → al menos 13 pines

CONTROLADOR VIKING

MC33996 → SPI

CONTROLADOR GPIB

Microcontrolador



Componentes

PCF8855

Controlador Capacitivo

PCA9952

led driver

I2C + INT + INT-IN

↓
salida inter
entrada

MC33996

16 output switch

ENC

ENC28J60

SPI + INT

Ethernet Controller

XRA1405

SPI + #IRQ

16 bit GPIO

PCA9564 Parallel to I2C

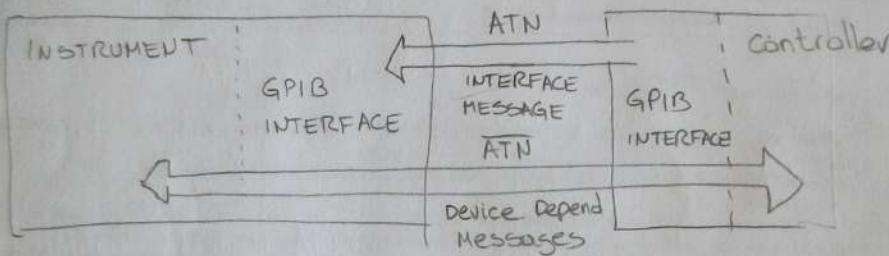
PCF8584 I2C bus control

PCA9555A 16 bit I2C 1/0

JAVA FX BINDINGS

$\$ \{ \langle \text{control}.value \rangle \}$ variable resolution operator
 $\$ \{ \text{controller}. \langle \text{value} \rangle \}$ $\Rightarrow \text{fx:controller} = "..."$
 ejemplo binding text = " $\$ \{ \text{controller}. \langle \text{property} \rangle \}$ ""

GPIB INTERFACE



Messages { Device Interface } ATN NOT asserted commands from controller to individual instrum
 ATN asserted commands from controller to control interface

IEEE 488 functions
 DCL Device Clear
 LLO Local Lock Out

GPIB address
 Listen address
 Talker address

Controladores
 Controlador Sistema → Controlador por defecto al iniciar puede usar líneas IFC REN
 Controlador a cargo (CIC)

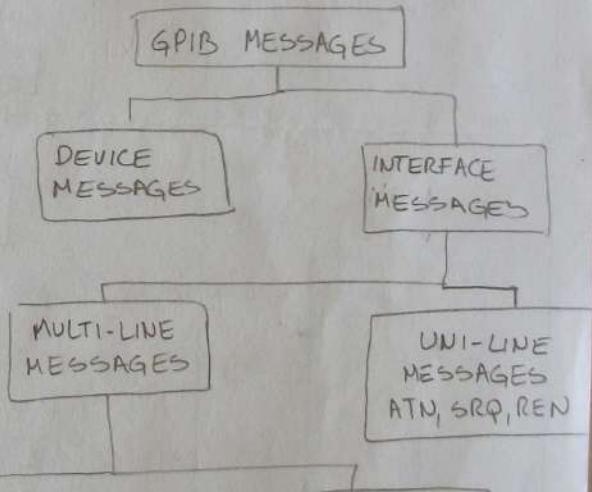
CIC es el único que envía mensajes con ATN assertada.

El controlador del sistema puede pasar el control a otro dispositivo capaz de controlar el bus

(Controller) (Talker Listener) ROLES

El controlador asigna roles (direccional)

En un bus solo puede existir un controlador CIC, un TALKER y múltiples listeners

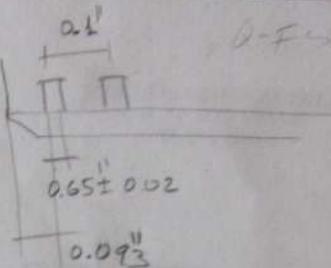
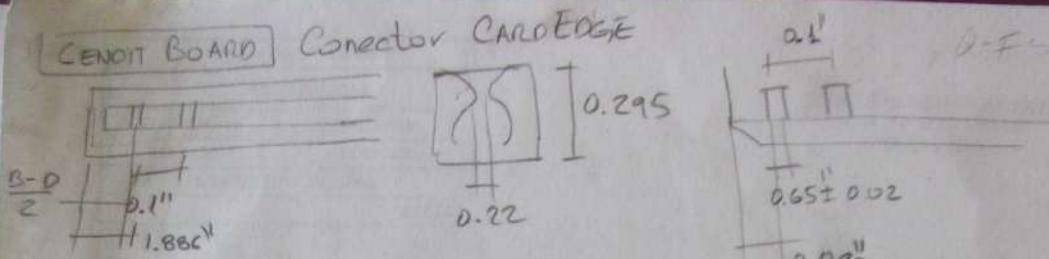


UNIVERSAL COMMANDS
UNT, UNL, SPE

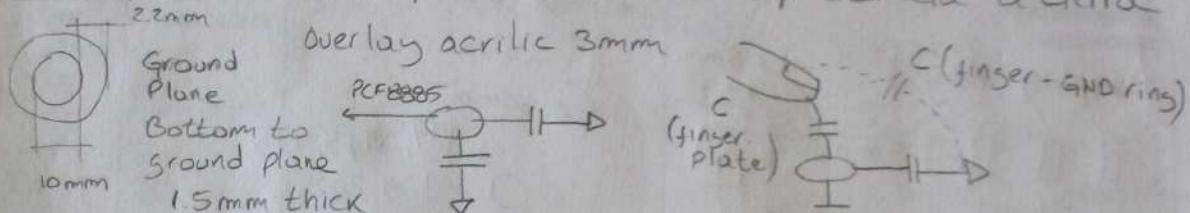
ADDRESSED COMMANDS
SDC, GET, GTR

3 líneas control bus
REN remote enable
ATN attention
EOI End or Identify

MULTI-LINE { 8 bits de datos
ATN asserted }



Sensor capacitive sensor plate \rightarrow Minimizar capacitancia a tierra

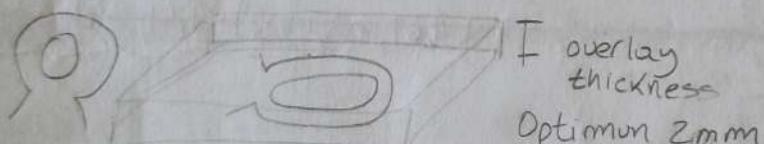


Capacitance

Finger-Plate	Finger-GND ring	Plate-GND ring	Plate-GND bottom
0.5pF	1.2pF	0.7pF	3.8pF

CST EM
Studio

GND ring separation > overlay thickness



Permittivity ϵ_r
FR4 4.7
Glass 5-10
Acrylic 3

Sensor plate Ideal 11mm, overlay 3mm, GND separation 2mm

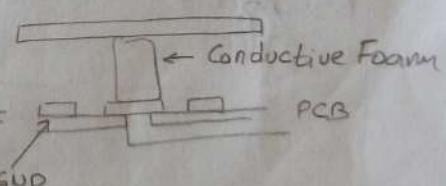
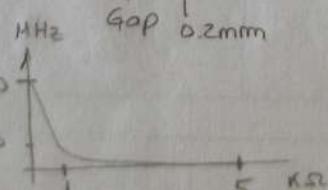
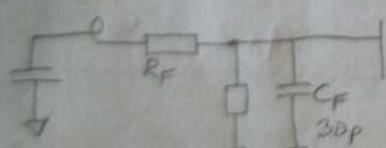
Sensor plate = overlay thickness + 8mm \rightarrow round shape

Overlay No debe deformarse, cambiaría la capacitancia de otros botones

Input capacitance range

10pF a 40pF

ON PCF8885
5K



Internal clock nominal 70kHz

$$f_{osc} = 70\text{ kHz}$$

$$f_{clk} = \frac{f_{osc}}{n} \quad n = 1, 4, 16, 64$$

$$f_s = \frac{f_{clk}}{B}$$

$$f_s = 0.55\text{ kHz}$$

Components on bottom layer

Sensor plates surround ground. Separation = overlay (2mm)

Hatched ground planes (20% metallization under plates)

Vr-unit 11713

Cendit Board

Cendit 11713

Power buses

5.0V 3.3V GND_D GND_A (Opción 1)

4.8-5.0V 3.3V GND_D GND_A GND_P (Opción 2)

12.0V

+ 24.0V + 5.0V + 3.3V GND_D GND_A GND_P (Opción 3)

+ 12.0V - 12.0V + 5.0V + 3.3V GND_D GND_A GND_P (Opción 4)

-0.37
+0.37

GND

2.7V

X10

4.05

5.0

13.533V

Nokia 1600

SOL 1 - - 10 VDD10

SOL 2 - - 9 VDDA

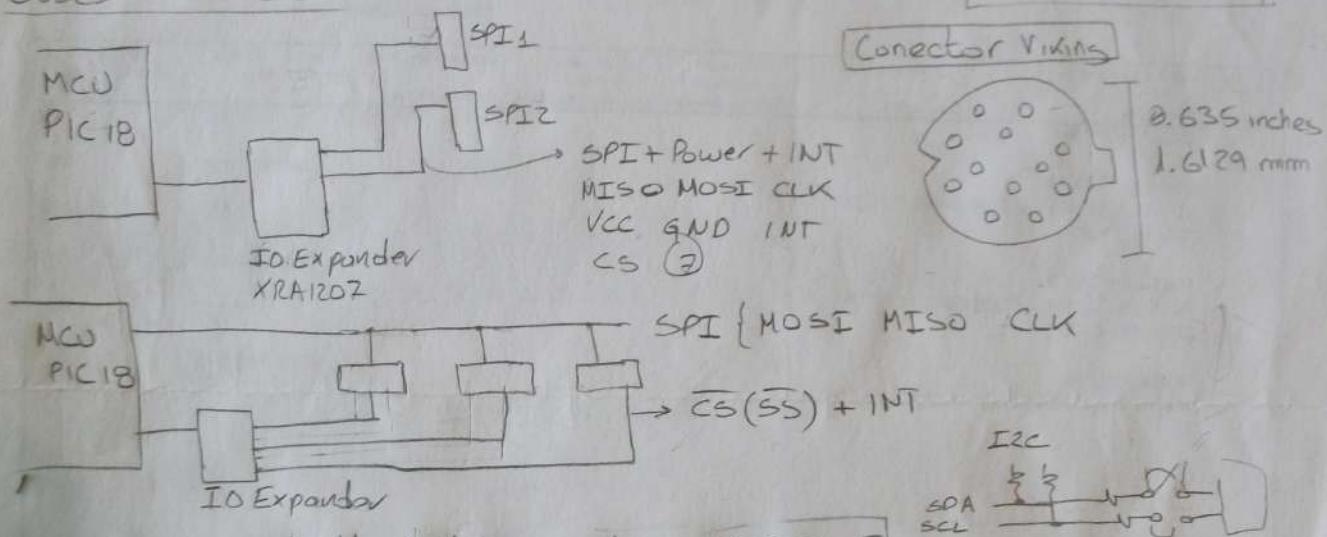
SOL 3 - - 8 ---

CS 4 - - 7 - VLED

RES 5 - - 6 + VLED

visible

Buses Serials



Controlador de Teclado Capacitivo [PCF8885]

SDA | SCL | A0 | INT | INT-IN | CLK-IN | CLK-OUT | SLEEP | VDD/VSS

+3.3V I2C

↓ Problema con polaridad

VDD | VSS | SDA | SCL | RESET | INT | A0 | INT-IN | CLK-IN | CLK-OUT | SLEEP

Bus basico I2C

Extension depuracion

Controlador LEDs 16 canales [PCA9952]

I2C

SDA | SCL | H0 | H1 | A2 | OE | RESET | VDD | VSS

VDD | VSS | SDA | SCL | OE | RESET

Bus Basico

Extension

Controlador de puertos [33996] SPI

S1 | S0 | SCLK | RST | CS | VDD/VSS

Controlador de Bus

[PIR] PCA6408A

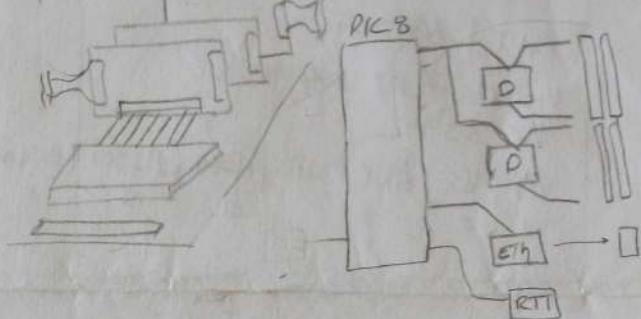
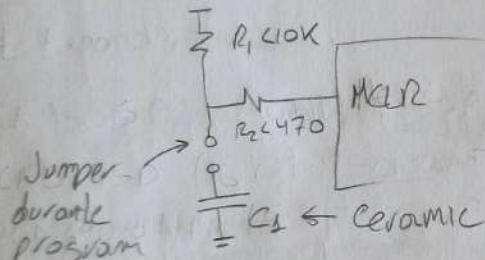
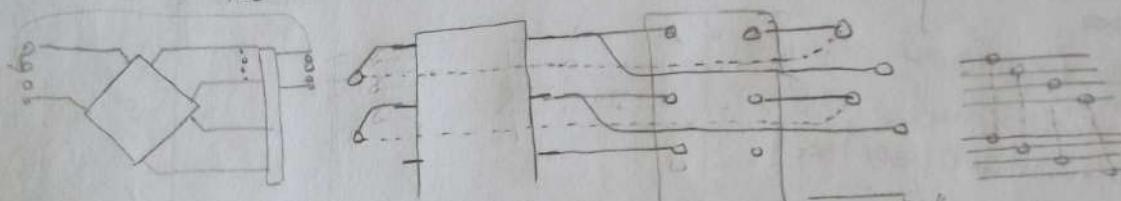
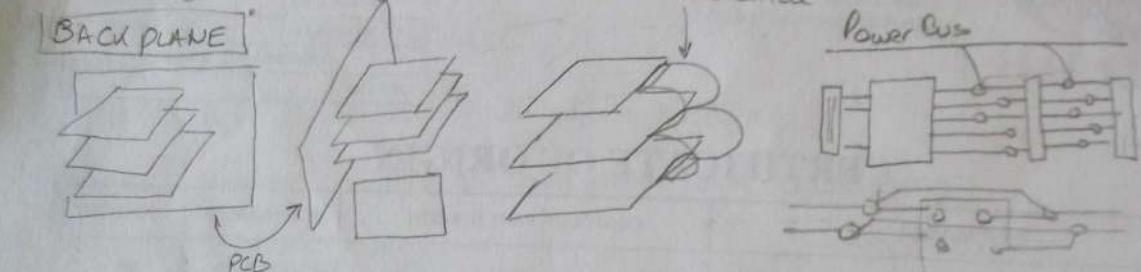
SDA | SCL | ADDR

VDD_P | VDD_I2C | GND
+5.0V 3.3V

RESET | INT

CENDIT 11713

Como organizar tarjetas



PIC18F45K50

Capacitores desacoplo 100nF 10-20V low ESR 200MHz (distancia 6mm)

Regulador VUSB3 → low ESR 1.5V (10uF)

ICSP pins PGC PGD for ESD protection RC100Ω

Oscillators (traces < 12mm)

Dedicated ICD (ICSP port (ICPORT))

ICPGC RB6

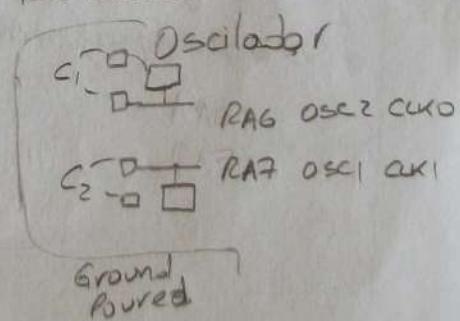
ICPGD RB7

ICRST MCLR ← Additional Reset
pull up needed

MSSP (I2C SPI)

RBO { SDA } RBS1 { SCK, SCL } RBS3 { SDO } RC7 { SDO } Alternativa depende
conf bits

VUSB CAPACITOR < 10uF (Rango recomendado 0.33uF - 8uF) 0.47uF



Ground
Poured

Estructura Generica Comando SCPI

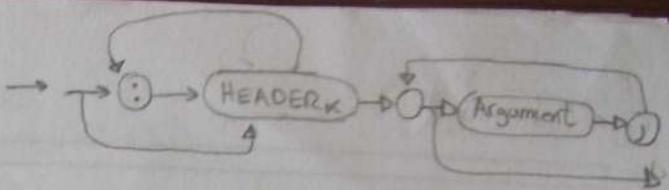
: HEADER₁: HEADER₂: ... (Arguments)

In sensible a Capitalización
IGNORE CASE

HEADER = header = HEADER = heADER

[: HEADER]: HEADER ← Algunas cabeceras son opcionales

: HEADER [: HEADER] ←



AGILENT 11713B/C

Consulta el número de ciclos reles

DIAGnostic : RELay:CYCles ? <channel list>

Limpiar el número de ciclos reles

DIAGnostic : RELay:CLEAR <channel list>

DIAGnostic : RELay:CLEAr:ALL

Abrir y cerrar switches

[:ROUTE]:CLOSE <channel list>

[:ROUTE]:OPEN <channel list>

[:ROUTE]:CLOSE:ALL

[:ROUTE]:OPEN:ALL

Establecer niveles TTL ON/OFF

CONFIGure : BANK1:TTL {OFF|ON}

Para consultar status

[:ROUTE]:CLOSE? <channel list>

[:ROUTE]:OPEN? <channel list>

Consulta status TTL

CONFIGure : BANK1:TTL?

CONFIGure : BANK2:TTL?

Mensaje GPIB no más de 170 caracteres. Un máximo de 6 comandos

en un mensaje simple.

Ej: :SWIT1? ; SWIT2? ; SWIT3? ; ... SWIT6?

Separadores

- (:) Separa cabeceras O espacio separa parámetro
- (,) Coma separador de parámetros (,) punto y coma combinar comando del mismo subsistema en una cadena de mensaje. También para unir comandos de diferentes subsistemas.

GPIB Events change in interface control lines, interface events, interface messages

Single control line \rightarrow Single line event

Data bus + ATN asserted \rightarrow multiline event

IFC: Interface Clear, force instrument to listen controller

REN: Remote enable, claim control instrument

EOI: End or Identify, with ATN=0 end data transfer.

With ATN=1 is performing parallel poll

SRQ: Service request

Single line events

DCL: Device Clear, clear input output buffers of all instruments

SOC: Selected device clear clears input output buffers of selected instrument

GET: Group Execute Trigger, all instruments receives trigger pulse

Forms RESET & CLEAR

Power ON: Instrument to initial state

Interface Clear: (IFC event) Resets GPIB bus to initial state

Device Clear: (DCL or SOC interface events) Resets information interchange controller \leftrightarrow instrument, clears input output buffers, aborts operations

Clear Status: *CLS clears whole status structure

Reset Command: *RST resets instrument specific functionality

Equivalent Power On RESET \rightarrow IFC, DCL, SOC, *CLS, *RST

GPIB LINES (signals TTL active low - asserted low)

8 DATA LINES

D0 D1 ... D7

3 HANDSHAKE

NRFD (not ready for data) from device (listener)

NDAC (not data accepted) from device (listener)

DAV (data valid) from controller

Active Low

OPEN

Collector

wired-and

5 MANAGEMENT

ATN (attention) from controller

IFC (interface clear) from controller

REN (remote enable) from controller

SRQ (service request) from any device

EOI (end or identify) from Talker or Controller

PPC listen address, data line, sense
Parallel Poll Configure, data line integer 0-8, if 0 Parallel Poll Disable (PPD) is set

PPU parallel poll unconfigure, clears parallel poll configuration

REN remote enable, asserts/unasserts remote enable

SPD send serial poll disable to all devices on the bus

SPE serial poll enable, universal, tells all devices on the bus to prepare to respond with status byte when addressed to talk

UNL macro unlisten universal message ATN(UNL), ATN(63)

OPC operation complete, based on SRQ

SRQ asserted when not understand command, when operation completed

Algunas tarjetas tienen por defecto EOI deshabilitado

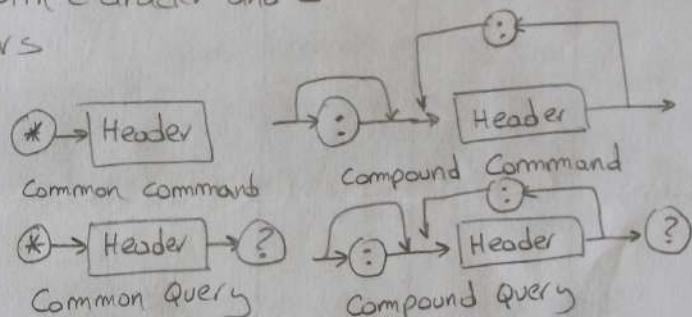
Commands & Queries

Header: max 12 chars, start with character and -

Command build up using headers

Command
Query
Compound
2 types

Command & queries
↳ tree structure



Numerical Data Decimal Numeric Integer: NR2 4, -23, 90
Real Numbers NR2 fixed points 23.45, 1.22, -4.55 Exponential: NR3 floating point

4.3E-3, -8.94E8, 123E-5

Numerical Non Decimal Hexadecimal #H3F #h3f Octal #077 #.77

Binary #B111111 #b111111

Text Data Char data mnemonics String data "textual data" 'text'

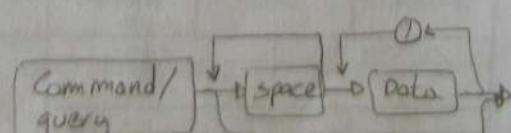
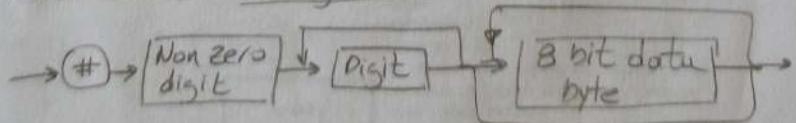
ASCII response data

Arbitrary block data

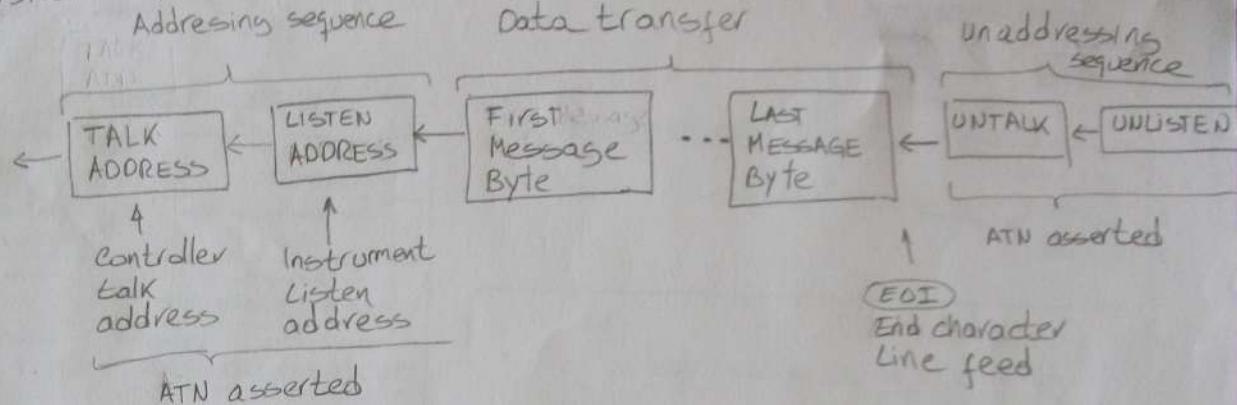
213 ...

[Next 2 bytes is block length

Command, queries, data



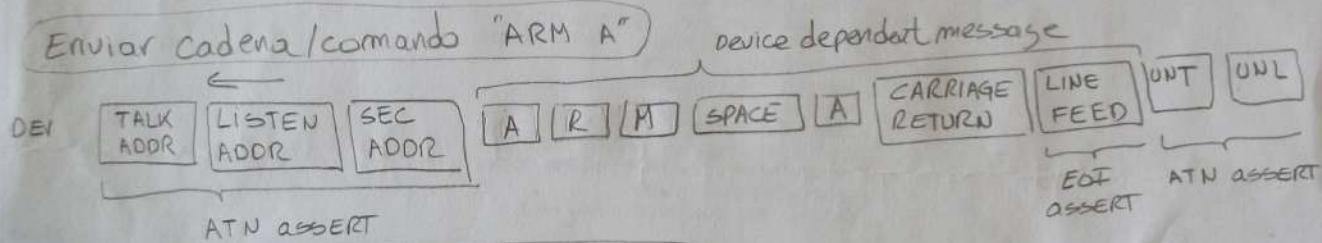
TRANSMISSION GPIB



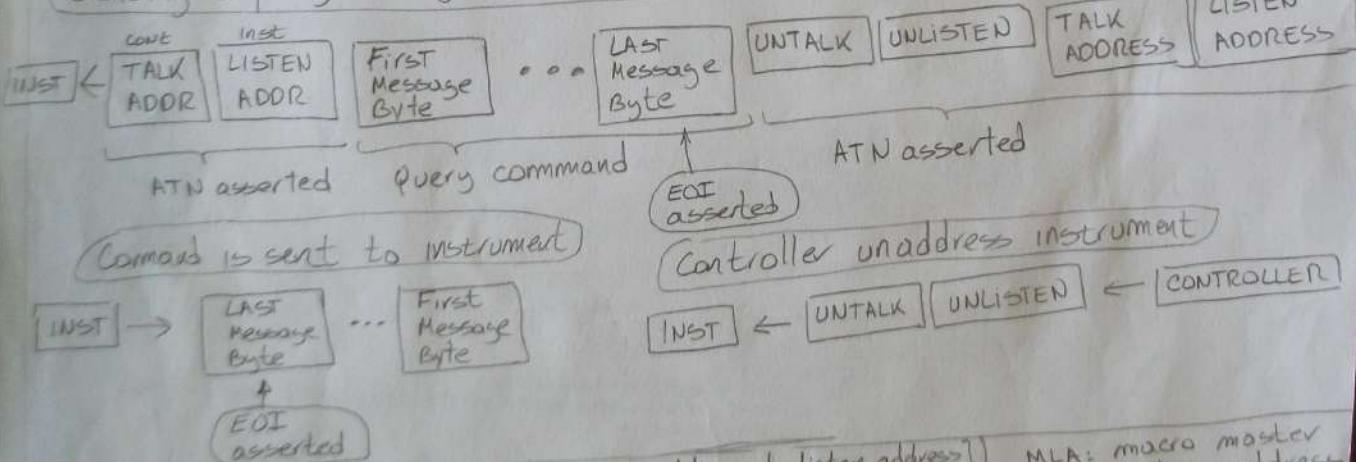
3 partes básicas en una transferencia: secuencia direccionamiento, transferencia datos, secuencia des-direccionamiento.

INSTRUMENT LISTEN ADDRESS: Primary Address + 32

TALK ADDRESS = Primary Address + 64



Sending a query and getting response



DCL: universal Device Clear
equivalent ATN(20)

EOI: assert EOI line

GET: send specified listen address followed
by GROUP EXECUTE TRIGGER

GET (listen address[, listen address])

MLA: macro master
listen address

GTL: sends listen address than
sends go to local (GTL)

IFC: Interface Clear, asserts the
clear line

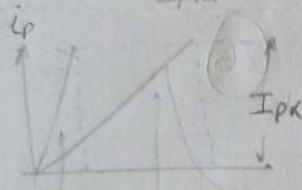
LLC: sends universal local lockout
ATN(17)

flyback App Note ON SEMI

Constant output

Corriente en el río

$$i_{PK} = \frac{V_{IN} T_{ON}}{L_{ORI}}$$



Hi input voltage Low input voltage

Pendiente
Ven
Cpri

Energy stored
ON Lime

$$E_{STD} = \frac{L_{PR1}}{L_{PK}} i_{PK}^2$$

Problema → Con V_{IN} alto el ON time del MOSFET es muy pequeño 300-600ns. El driver no puede proveer suficiente corriente para saturar MOSFET.

$$\hat{E}_{PA} = \sqrt{\frac{Z_{PAUT}}{L_{PAI} + (V_e)}}$$

$$- \text{freq función del error} \rightarrow Pout \leq \frac{L_{PRI}}{2} \left(\frac{V_{IN(\text{min})}}{L_{PRI}} \right)^2$$

$$t_{ON} = \frac{1}{V_{IN}} \sqrt{\frac{2P_{OUT} L_{PRI}}{f}} \rightarrow A 125V_{DC}(90V_{AC}) \rightarrow V_{IN(\min)} = \frac{1}{2} T$$

$$\frac{f_{\max} L_{PRI} i_{PK}^2(V_{INmin})}{2} = \frac{A V_{IN}(\max) \rightarrow freq_{\min} = \frac{1}{2} freq_{\max}}{f_{\min} L_{PRI} i_{PK}^2(V_{INmax})} \rightarrow \frac{i_{PK}^2(V_{INmax})}{i_{PK}^2(V_{INmin})}$$

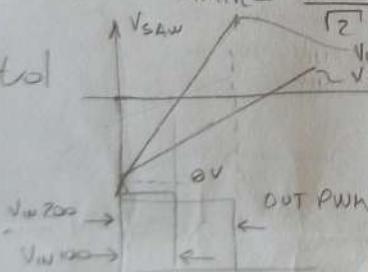
$$i_{PK}(V_{IN\max}) = \sqrt{2} i_{PK}(V_{IN\min})$$

$$B_{max} = \frac{1}{2} B_{SAT} @ 100^\circ C \quad B_{max} = d I_{PKmax}$$

$$B_{min} = d I_{PKmin}$$

$$\frac{B_{\max}}{B_{\min}} = \sqrt{2} \rightarrow B_{\min} = \frac{B_{\max}}{\sqrt{2}} = \frac{B_{SAT}}{\sqrt{2}}$$

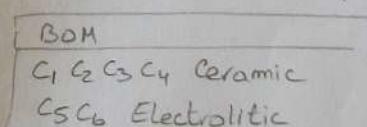
PWN control



$$V_{SAW} = \frac{V_{IN}}{1}$$

$$D = \frac{t_{ON}}{T} = \frac{V_C}{V_{DD}}$$

BOM
C₁ C₂ C₃ C₄ Ceramic
C₅ C₆ Elast - ictic



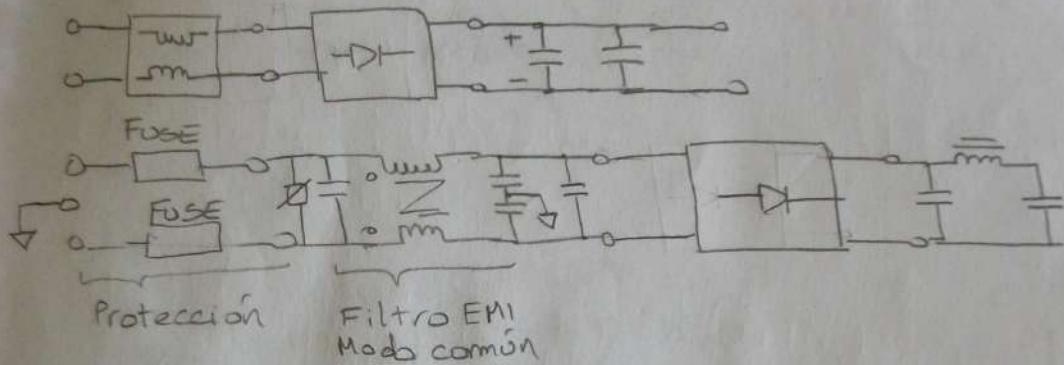
IFET Driver
H-bridge Driver

V_{ref}

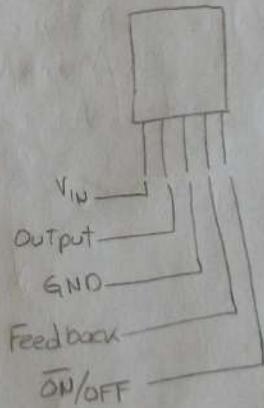
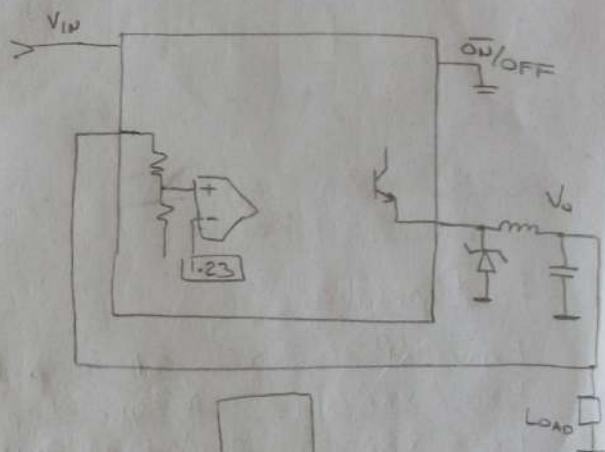
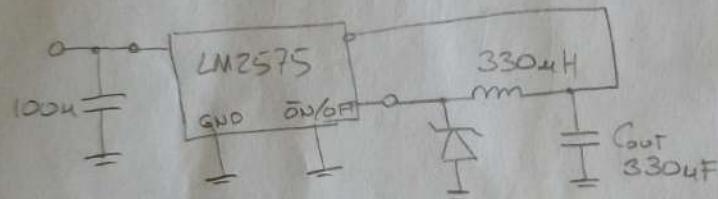
HVDC
V_{in}

①

Fuente de pruebas



Fuente con LM2575



Panel: MEASURE (Frequency/Freq) (Plan/Mode) (Averaging/Calibration)

(Mode Setup) (Calibrate) (ENR)

ENR → mode [Table, spot], spot Mode [ENR, Task]

ENR → ENR TABLE → Fill from SNS

ENR → TCOLD
SNS TOOLS
OFF OFF
Dither Tools
OFF ON
Upper Value
Normal SNS
Auto Lock & Enter
Off On.

ENR UNITS { dB, K, C, F }

ENR → menu adicione de tablas

Setup de frecuencia
para
→ TAREAS/TASKS
→ INSTRUMENTO
(SYSTEM)

Option Freq Mode { Sweep List }
Fixed
Sweep Range
→ Sweep List
→ Freq List
→ Fixed

Setup Container View

BASIC Frequency SETUP

Mode { Choice Box }

Rango Lista Fija

Lay-out para ENR

ENR mode Common Table

ENR Table & Cal Table &

SPOT & Task &

ENR → ENR Table editor + Cal Table editor

SPOT	SPOT Mode	SPOT ENR	SPOT THRE
	FEAR THRE	Field	Field
SNS Tools	SNS Tools	Upper Tools	Upper Tools
ON OFF	ON OFF	From SNS	From SNS

Dash Board

≡ TITULO

10

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2

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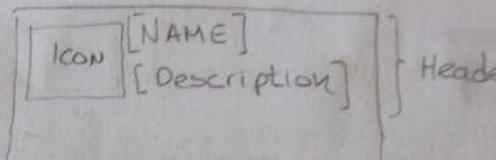
264

265

266

VIEW

- name - image X
- description
+ getName(): String X
+ getDescription(): String X
+ setName(name: String)
+ setDescription(desc: String)
+ setImage(url: String)
+ getImage(url: String)

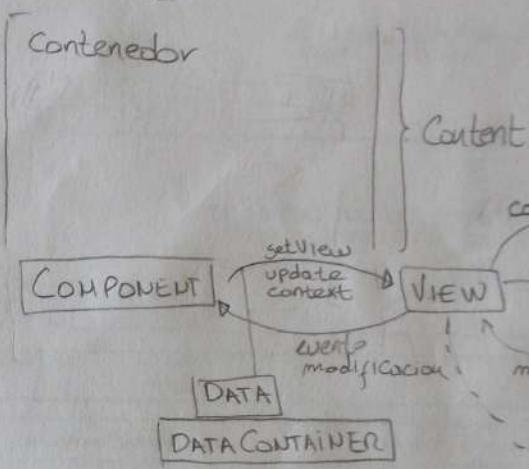


130 68 9318

130 468 9319

COMPONENT

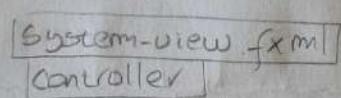
enterCONTEXT (CONTEXT)
exit CONTEXT (CONTEXT)
get VIEW (CONTEXT): VIEW
updateView (CONTEXT, VIEW)



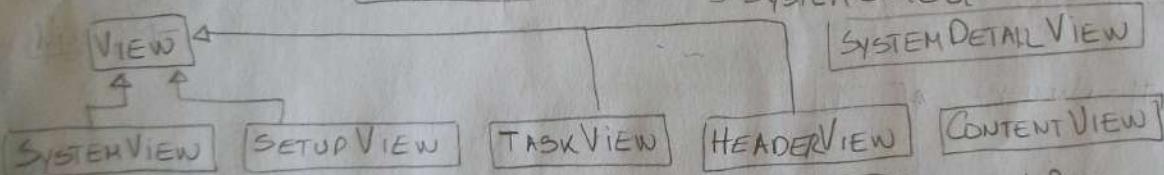
CONSTRuye nodo javafx
a partir de VIEW



SYSTEMVIEW



SYSTEM Node
SYSTEM Control



Component DETAIL
Component Setup



SYSTEM LIST VIEW
SYSTEM LIST ITEM VIEW

SYSTEM DETAIL VIEW

Component List
Component List Item

VIEW facade ante jfx

cargador de archivos

fxml

controlador xml

+ update()

+ update (Context)

creditLab.jar
java -jar creditLab.jar

exec sh

VIEWFactory → createView(Context) → View

↳ Usa ViewFactory para code sistema de ventanas.

MANEJO de **TASK** (**SYSTEM**) y sus vistas **VIEW**

SYSTEM → Vista **SETUP** **TASK** → Vistas **Normal** **SETUP** **Ejecucion**

Modelo Vista Componentes **COMPONENT** ↔ **VIEW**

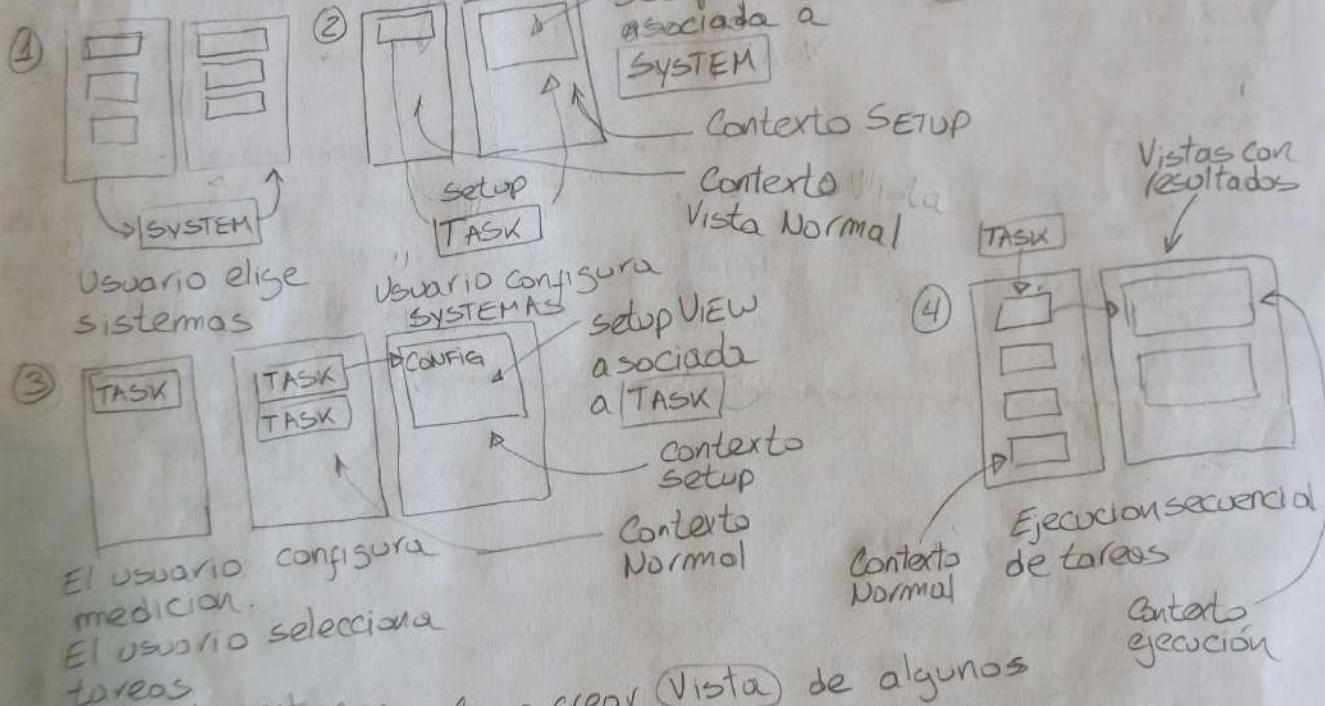
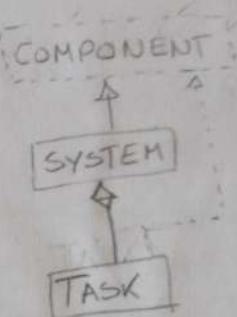
COMPONENT → Tiene asociada una vista de acuerdo al **Contexto**

COMPONENT → **CONTEXT** → **VIEW**

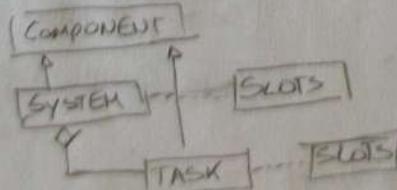
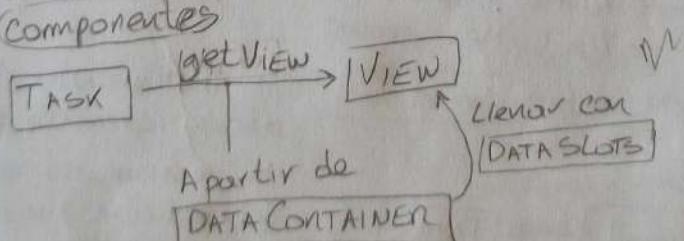
+ get View (CONTEXT) : VIEW

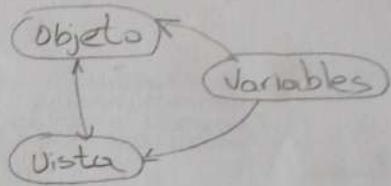
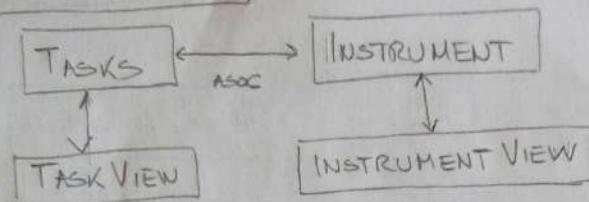
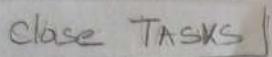
+ execute (CONTEXT)

Ciclo de vida de **COMPONENT**

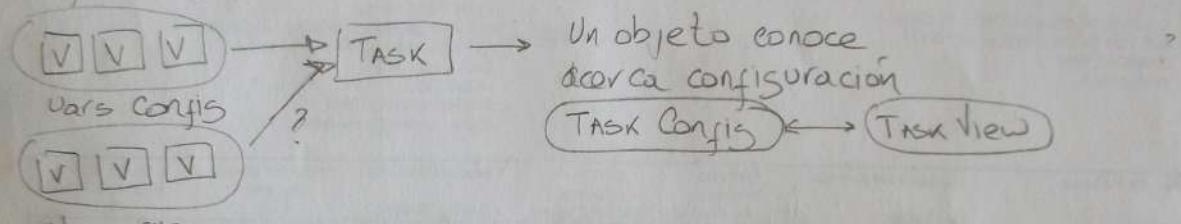


Esquema de ventanas Como crear **Vista** de algunos **Componentes**

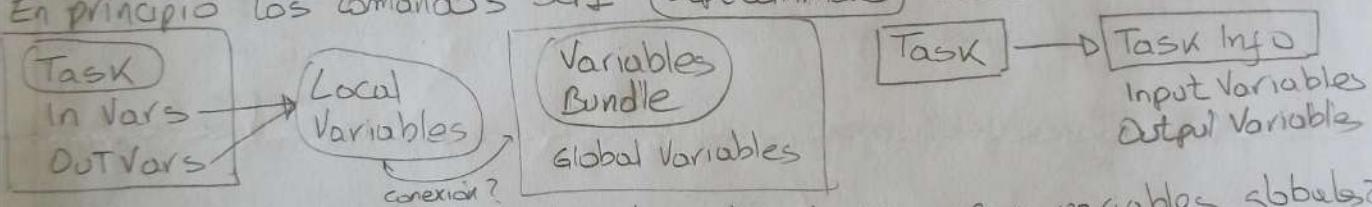




• Cómo configurar objetos que requieren configuración?
De forma genérica

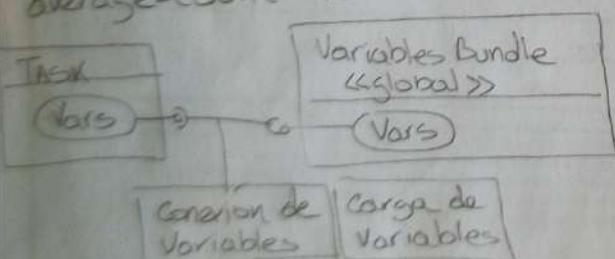


Vars exec
Task retorna objeto TaskView con vista de configuración: solo los objetos Task conocen como aplicar la configuración
En principio los comandos SCPI (ScpiCommand) hacen uso de Variables



Claro, conectas variables locales de tarea con variables globales?

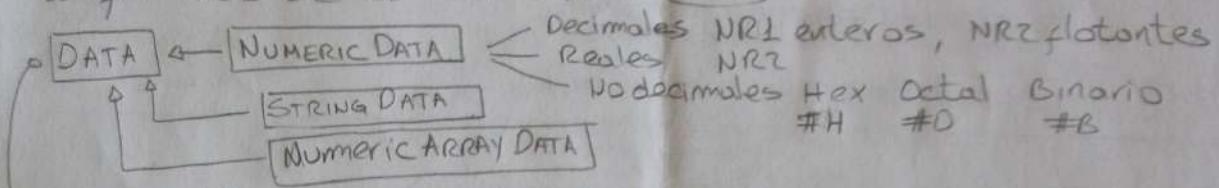
Usa tarea de ejemplo (TASK) para establecer configuración
SET MEAS PARAMS frequency-stop (1.2GHz) numero-puntos (21) average (ON)
average-count 15 bandwidth (40 000 000) continuous (OFF)



SET MEAS PARAMS
Input Vars / Config Vars

frequency-stop (12GHz)
 point-number (21)
 average (ON)
 average-count (15)
 bandwidth (40000000)
 continuous (OFF)

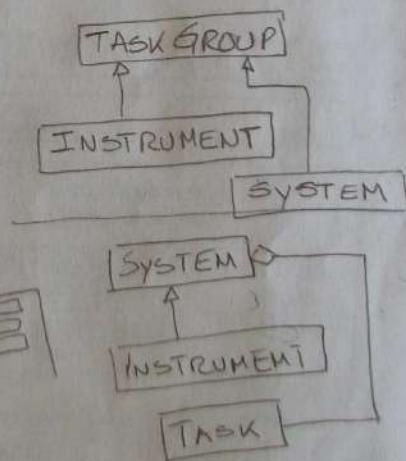
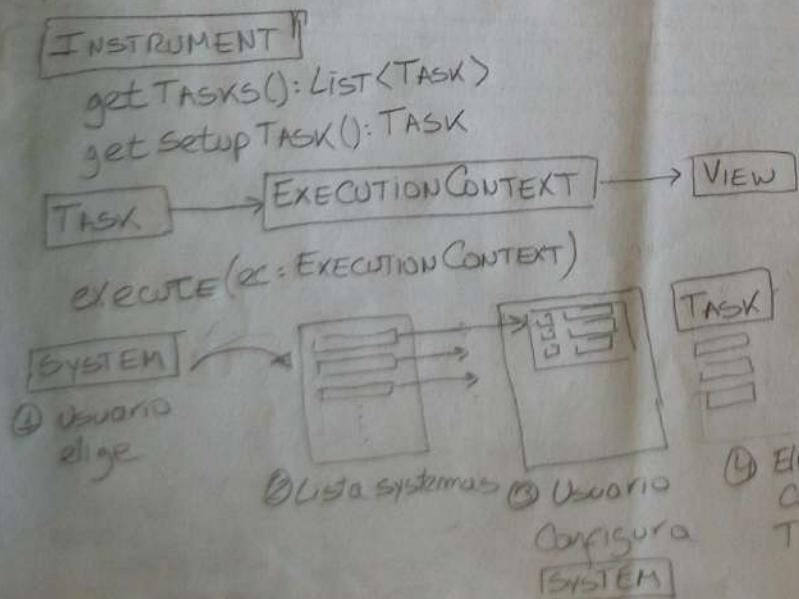
Problema: como representar y convertir datos de acuerdo al formato de los comandos (SCPI)



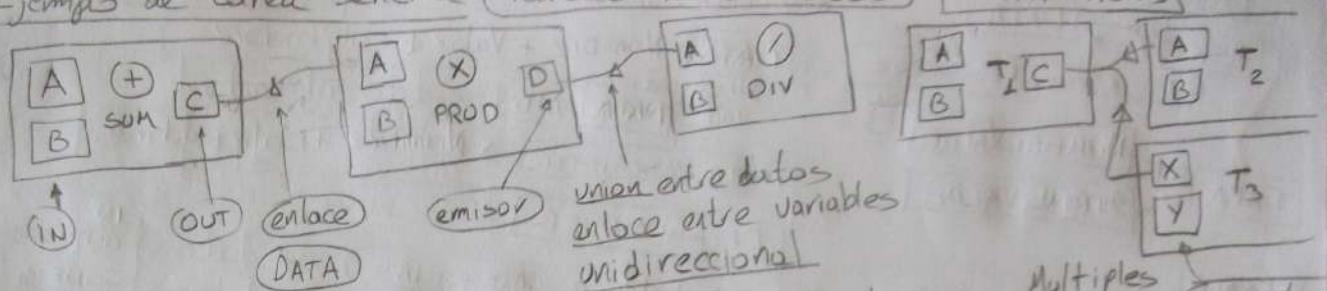
→ Funciones de **validación** y **conversión** estáticas

INSTRUMENT pudiere ser **real** → requiere CONNECTION
Virtual → NO requiere CONNECTION

Los tareas de apoyo no requieren conexión
 Un instrumento formado por otros instrumentos requiere multiples
 objetos CONNECTION UN INSTRUMENTO compuesto NO requiere de
 métodos para abrir conexión.



Ejemplos de tarea sencilla (Tareas matemáticos) | MATH TASKS



Objeto (DATA) puede contener un (valor) o contener un (enlace) a otro objeto (DATA)

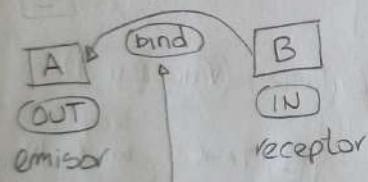
DATA.setValue(object) DATA.setBind(DATA)

A → B enlace circular
A enlaza B, B enlaza A
A.get() → B.get() → A.get()

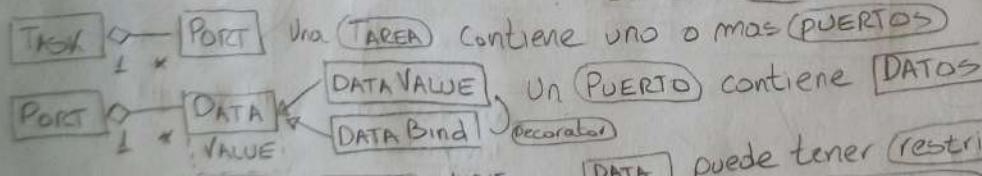
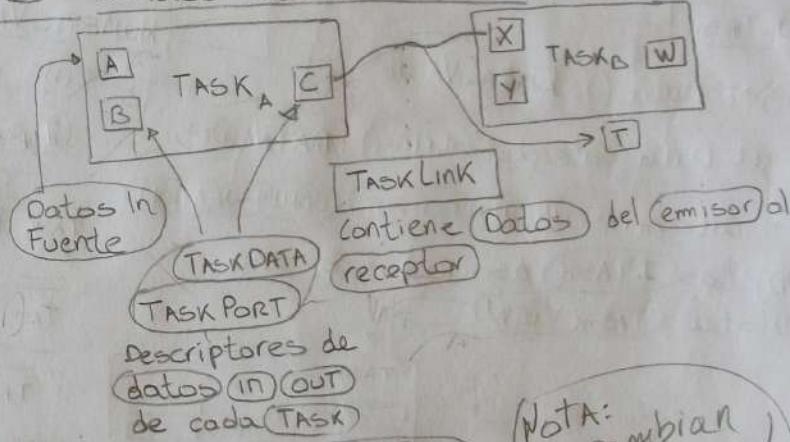
DATA conjunto de valores
Variables

VALUE
VARIABLE

Enlace valores/variables Enlace entre Tareas



B se enlaza con A
valor B = valor A



DATA
Value: Object
get, set: Object
NAME
Bind: Object

```
Task
get Port(NAME): Port
get InputPort(): Port
get OutputPort(): Port
```

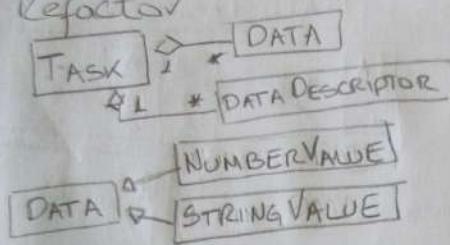
puede tener restricciones (propiedades)
tipos (calificadores)

DATA QUALIFIER → DATA

DATA TYPE → DATA DIRECTION → DATA ACCESS
IN → OUT → Bidir
Public → Private

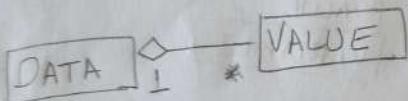
Variables

Refactor



ITASK

- input DATA: List<DATA>
- output DATA: List<DATA>
- + get Input DATA(): List<DATA>
- + get Output DATA(): List<DATA>
- + get DATA By Category(): List<DATA>



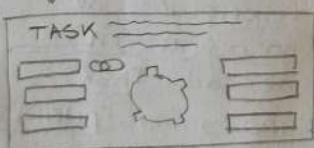
ITASK

get Data(): DATA VALUE

get Data(category: String): DATA VALUE

categorías (INPUT) (OUTPUT) (CONFIGURATION)

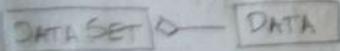
Objetos (ITASK) asociados a una vista (TASK VIEW)



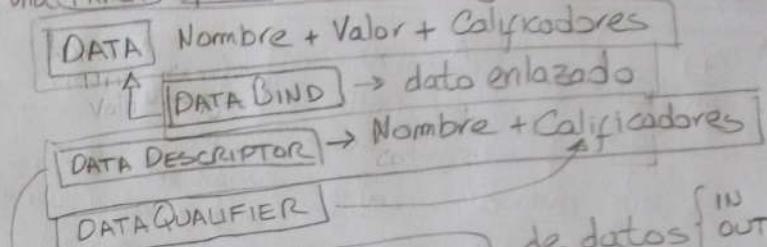
REFACTOR!

DATA → DATASET

VALUE → DATA



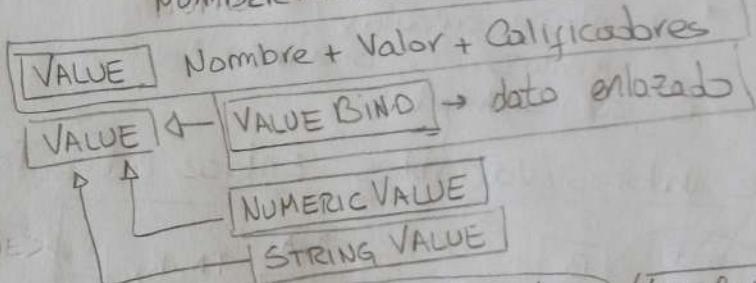
Una TAREA opera sobre un conjunto de DATOS



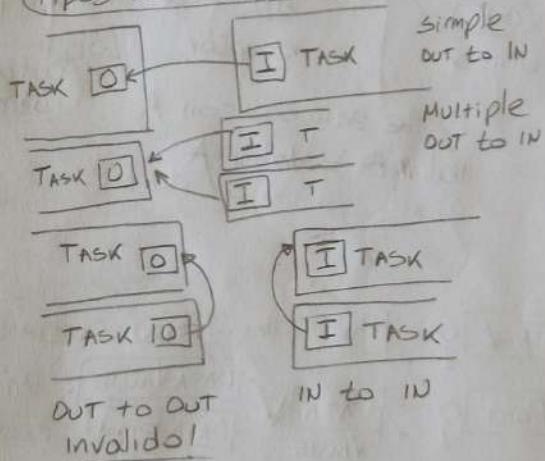
DEstablece CATEGORIAS de datos
Establece PROPIEDADES de datos
Forma de ETIQUETAR DATOS

Conversion datos

NUMBER VALUE IS Valid (Object)
NUMBER ARRAY IS Valid (Object)



Tipos de Enlace (Value Bind)



Pantallas Nokia 5200 / 6070 / 6080 → pantalla grande
6125 / 6060 / 7360 / 6101 / 6103 / 7360 / 451

Pantalla Nokia 1600 → pantalla pequeña

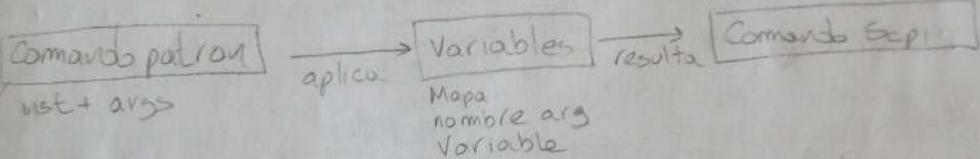
Las pantallas compradas parecen ser de Nokia G125 compatibles con
1600 / 2310 / G125 / 1071

P1600 → controlador ST7628

Conectores Hirose Lc pequeño Hirose DF23-10DS

Modelado GUI

Scpi Command → Contenedor comando + Variables
comando → instrucción + argumentos



→ Formato comando patrón :CMD:CMD:\$arg-name\$, \$arg-name\$
→ 2 tipos ① con argumentos, ② sin argumentos

2. Dos constructores ① Comando: Cadena → sin argumentos ②
② Comando: Cadena + Argumentos: Variables Bundle

→ Caso ① No hace falta extraer nombres argumentos
Caso ② Extraer nombres argumentos y crear un Variables Bundle interno, sin Variables

Caso ② Verificar que los nombres argumentos se encuentren en Variables Bundle, crear Variable bundle
② La verificación de la correspondencia entre nombre argumentos y Variables se hace cuando se requiere el comando

Al desechar mantener control de los nombres de argumentos y sus respectivos
variables. 2 formas

- Crear un objeto Variable Bundle interno - Guardar el Variable Bundle Externo
- Mantener lista con nombre de argumentos



new → Valida datos

Cadena con comando SCPI + Placeholder
vars in + Placeholder
vars out
() []

extraer nombres → set con nombres vars

Comprobar disponibilidad de variables en Contenedor Variables

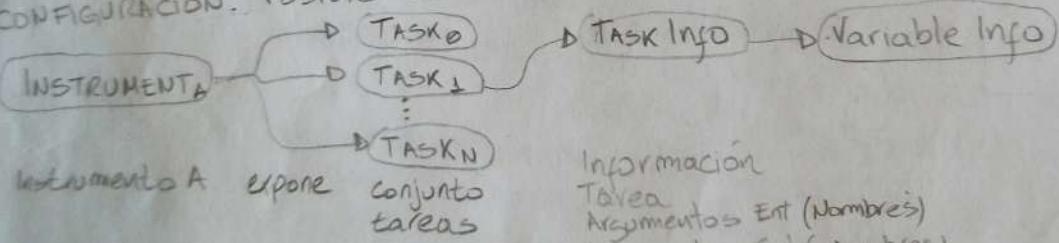
Comando SCPI valido → tiene argumentos → están presentes todos en el contenedor de variables (Variable + null)



NFA → el valor 9.91E+37 representa el valor NaN el cual indica que ha habido un problema en el cálculo del resultado. Intento de leer datos sin ejecutar calibración.

Como agrupar las funciones → subsistemas SCPI.
Como exponer las funciones al usuario → Instrument Task Task Info
Como encontrar instrumentos → Instrument Finder

Una TAREA/TASK debe poseer PROPIEDAD que entregue CADENA DESCRIPTIVA PROPIEDAD CON ARGUMENTOS DE ENTRADA, ARGUMENTOS SALIDA, ARGUMENTOS CONFIGURACIÓN. Posiblemente una PROPIEDAD CON DESCRIPCIÓN DE TAREA

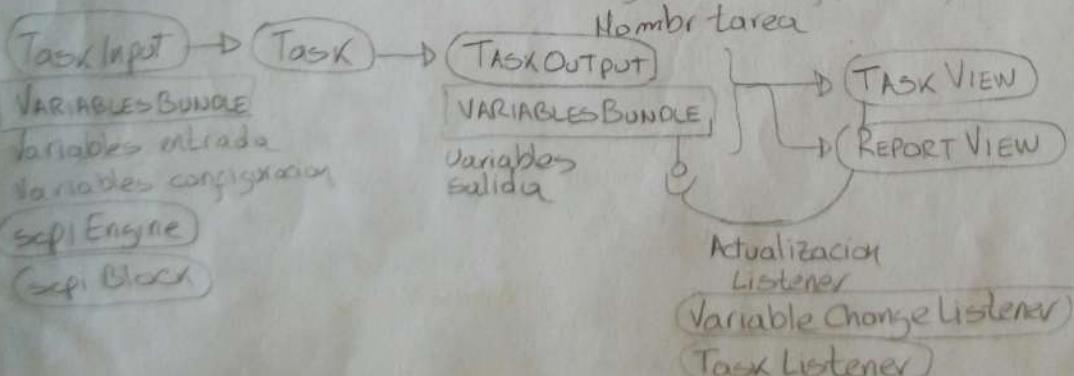


Instrumento A expone conjunto tareas

Información

Tarea
Argumentos Entrada (Nombres)
Argumentos Salida (Nombres)
Argumentos Config (Nombres)

Nombre tarea



Actualización

Listener

Variable Change Listener
Task Listener

View → Validos datos



SILICON LABS

1000 NORTH MAIN STREET
MANSFIELD, TX 76063
silabs@supplier-direct.com

PCF 1179C 40DIGIT CLOCK \approx 24 Sept
PCF 85263A AT RTC

FEDEX TRACKING NO.	
638695084960	
INVOICE NO.	INVOICE DATE
37802410	04/27/15
CUSTOMER P.O. NUMBER	
SL4824	

CERTIFICATE OF ORIGIN

PART NUMBER	CUSTOMER PART NUMBER	HTS NUMBER	COUNTRY
<p>CP2108-B01-GM C8051F320-GQ SIM3U156-B-GQ</p> <p><u>Graph Data</u> → String List Object [][] Object [] List Data Parse from Matrix cols Parse from columns [[]] [] parse from rows [] parse from list List DATA ... var chov</p> <p><u>Graph Point</u> [][] → extraer vista de datos</p> <p><u>Graph Data</u> → DataView</p>	<p>[DATA] → Inicializar DATA() Const sin params DATA(valor) Con valor Inicial</p> <p>Component → VIEW DATA set → update → set Validation DATA PARSER DATA DESCRIPTOR</p> <p>MVC - MVP View → Presenter Presenter → Model Model → View</p>	<p>8542.39.0000 8542.31.0000 8542.31.0000</p>	<p>TW TW TW</p>

BLANKET PERIOD
None - single shipment inv. # 037802410

FROM: _____

TO: _____

Peter Shytle

Silicon Laboratories

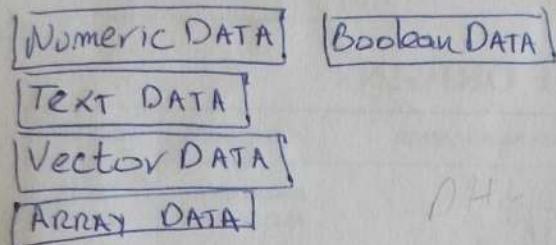
04/27/15

Date

View → Validator class

En **TASKS** **DATA**, tipos de datos admisibles + representación visual en **Views**.

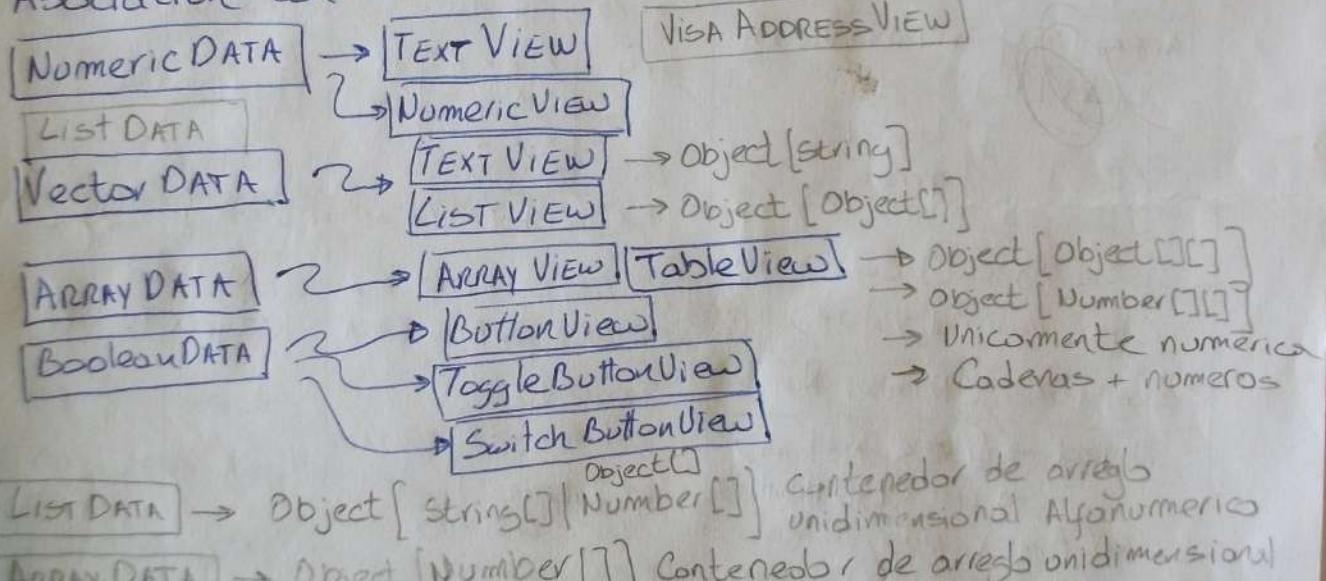
Por medio de herencia



Funciones estáticas para validación

isValid, isValidFormat
checkFormat

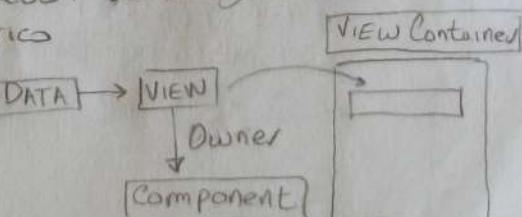
Asociación con vistas



Objetos accesorios para DATA

DATA PARSER → validación + conversión

DATA Filter → conversion data



Para GridPane columnas iguales se debe establecer prefWidth o el percentHeight
DATA Array: considerar tipo de matriz de entrada en Object[][] y copiar



1000 NORTH MAIN STREET
MANSFIELD, TX 76063
(682) 518-7053

A New Direction in Mixed-Signal

EDEX TRACKING NO.

643136023357

INVOICE NO.	INVOICE DATE
38205378	06/17/15
CUSTOMER P.O. NUMBER	

21398

CERTIFICATE OF ORIGIN

BLANKET PERIOD

P. D. Shaffer
Estate Planning

THE CORRESPONDENCE

08/17/16

Resistores KOA SPEER

4.7K	1206	0.25W	10
4.7K	1210	0.50W	25
75Ω	1210	0.50W	10
33K	1206	0.25W	10
6.8K	1206	0.25W	10
18Ω	1206	0.25W	10
3K	1206	0.25	10
10K	1206	0.25	10
300	1206	0.25	10
2K	1206	0.25	10
5.1K	1206	0.25	10
1K	1206	0.25	10
220	1210	0.50	20
33	1210	0.50	10
10K	1210	0.50	25
100	1210	0.50	10
1M	1210	0.50	10
1K	1210	0.50	25
470	1210	0.50	10
510	1210	0.50	20
75	1210	0.50	10
4.7K	1210	0.50	25
4.7K	1206	0.25	10

Capacitores

100n	1206	50V	25
18p	0805	50V	12
22p	0805	50V	12
22u	1206	25V	10
100n	1206	25V	10
4.7u	1206	10V	10
1M	1206	16V	10
470n	1206	25V	10
10p	1206	50V	10
1M	0805	16V	25
10M	1206	10V	25
10M	1210	10	10

[Disponibles]

750Ω 0805	10M 0805
511Ω 0805	515Ω 0805
15KΩ 0805	
4.7KΩ 0805	
1KΩ 0805	
100KΩ 0805	
10KΩ 0805	
330Ω 0805	

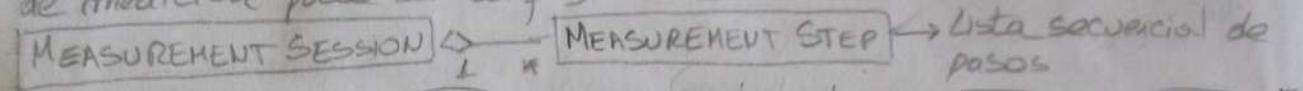
Tamaños resistores

0402	0.1W
0602	0.1W
0805	0.25W
1206	0.25W
1210	0.50W
2010	0.75W
2512	1W
2812	2W

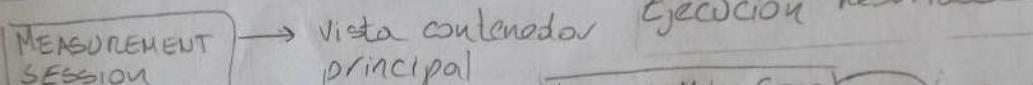
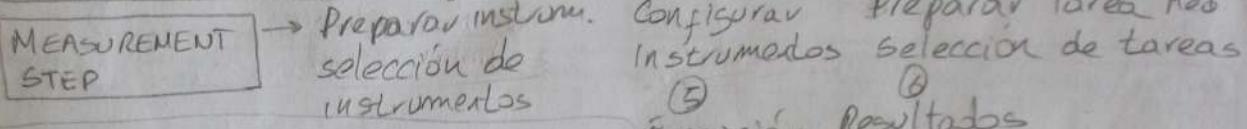
- ① RED ⑪ 100/RES
- ② GREEN ⑫ 101/50A
- ③ BLUE ⑬ 15SYNC
- ④ IO/RE ⑭ VSYNC
- ⑤ GND ⑮ 103/SCL
- ⑥ RED/RTN ⑯ GREEN/RTN
- ⑦ BLUE/RTN
- ⑧ KEY/PWR
- ⑨ GND

Cableado sur quince
en Akabala es peligro Cct
entre Plaza
y centro local 12 PB
entre Simon Bolivar
y centro Local 2
local 21 PB
San Bernardo Av Vollmer
El Madroño 1B Local 2

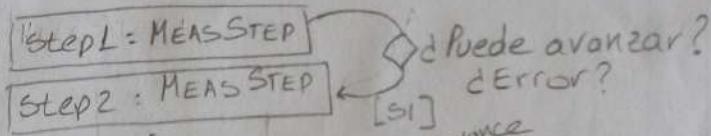
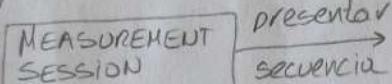
CENDIT LAB → La medición es una sucesión de pasos, una session de medición puede ser configurable



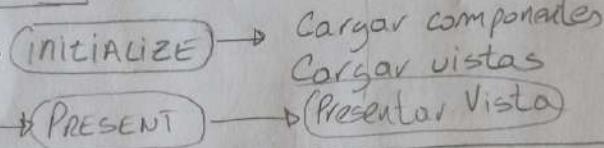
Cada **PASO** tiene **1 o +** vistas asociadas **paso** → **vista**
 o cada **(PASO)** tiene asociados **1 + Componentes** y **1 +** **vistas contenedor**



Crear Agregar



MEASUREMENT STEP



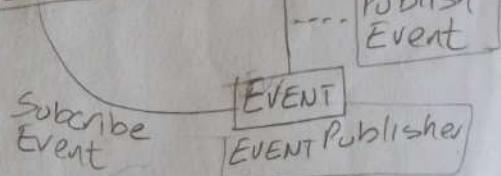
MEASUREMENT STEP ← owner

- + can Advance() / is Done()
- + has Error()
- + present()
- + owner Session
- + initialize
- + load
- + unload

EVENTOS
 on Present
 on Initialize
 on Load
 on Unload

MEASUREMENT SESSION

COMPONENT



Subscribe Event

VIEW compuesta



Evento GUI → **listener JavaFX**
 JavaFX → **Intercepta** → **Traduce**

(listener externo)
 función publica evento

función objeto
 on Accept accept Event

get Event (Event ID). subscribe (handler)

→ devuelve Event Publisher → Event Handler

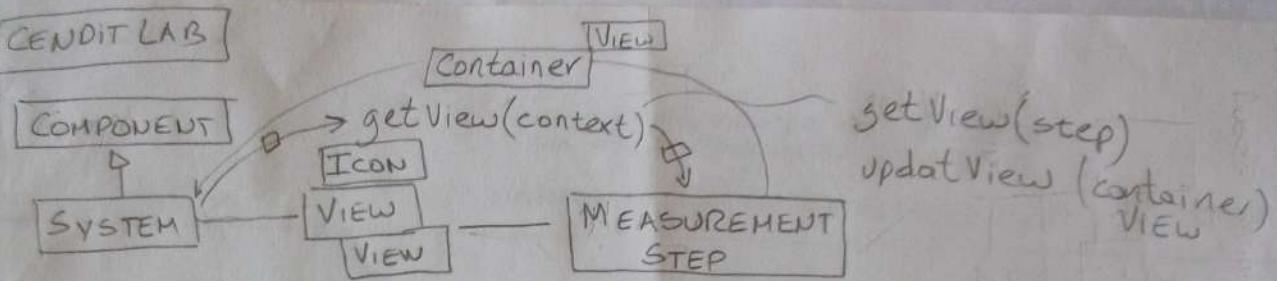
subscribe Event (Event ID, event Handler)

unsubscribeEvent (Event ID)

Map { Event ID, List<handlers> }

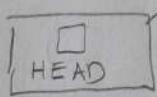
Event Handler (EventArgs)

EventArgs → Map { NsID, Value }



Un conjunto de
vistas para
cada paso

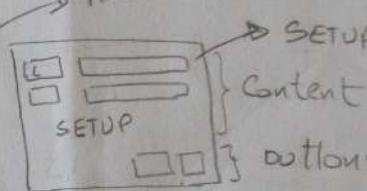
Vistas de SYSTEM



Vistas de TASK

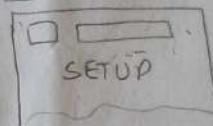


HEAD Bitaina View

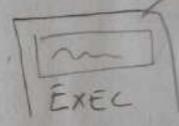


Content

Buttons

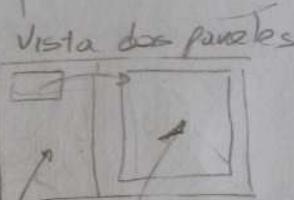


SETUP



EXEC

EXEC CONTAINER VIEW



Vista dos paneles

Cadena JSON → VIEW

View Factory

APP → Main Window → Container View

COMPONENT Container List

SYSTEM VIEW → get View (CONTEXT) → VIEW FACTORY

COMPONENT → update View (Context, View) → SETUP EXEC DESCRIPTION

update View (Measurement Step, View)

secciones

Master Detail View

⑤ CompList View

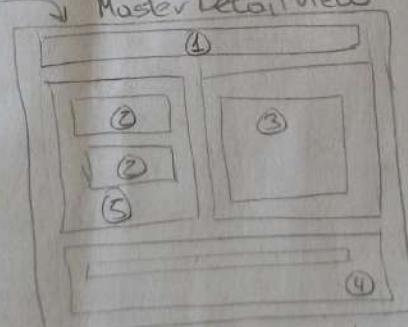
① Header View

② Sys Head

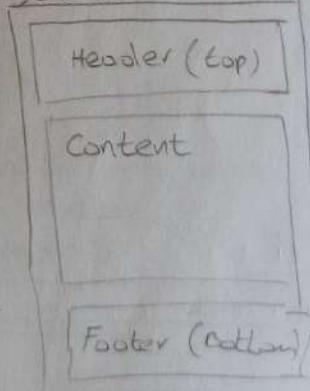
③ Sys Setup

④ Footer

Vista contenedor
generico



Vista doble panel



Vista simple panel

VIEW Factory

SYSTEM VIEW → create View (ViewType)

MEASUREMENT SESSION

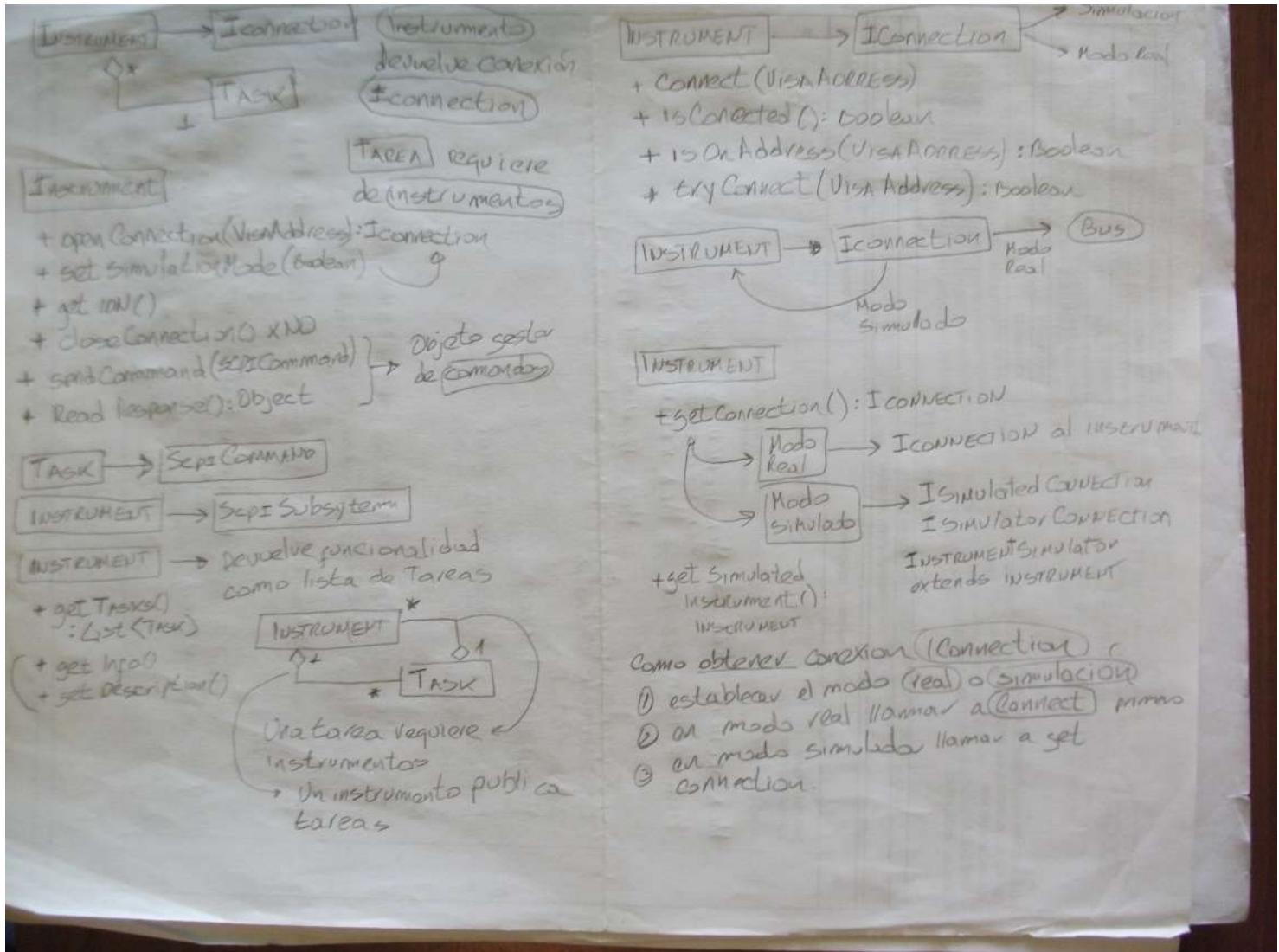
MEASUREMENT STEP

Component View

① carga

② devuelvel
Vista

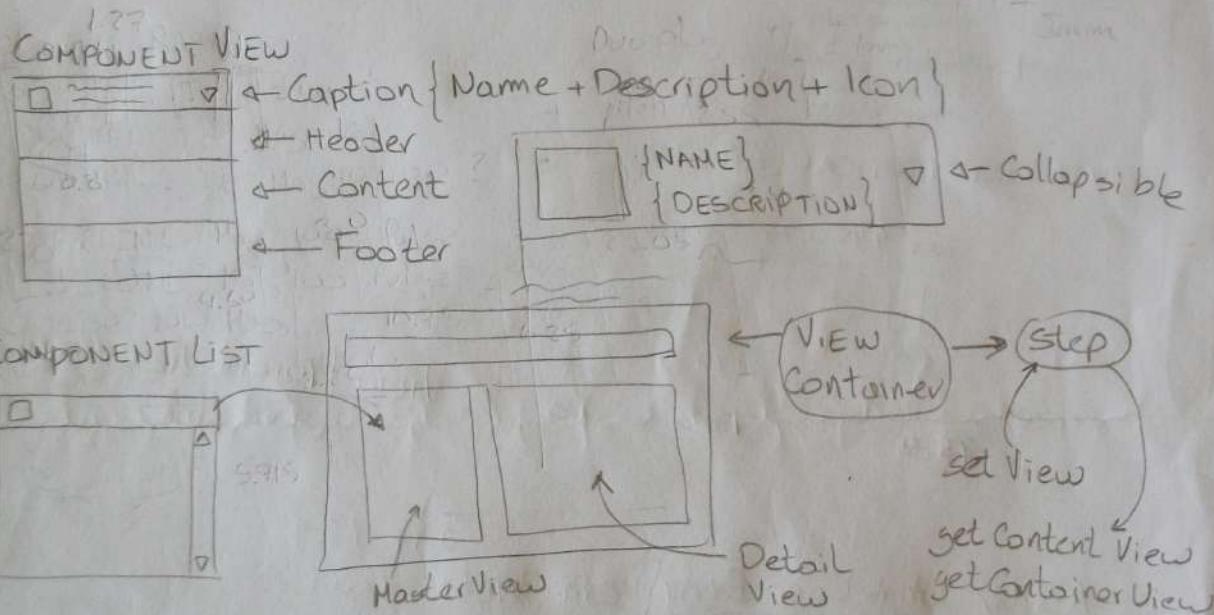
③ unos tipos de vista



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COMPONENT SLOTS VIEW
SETUP VIEW

add (SLOT, SLOT VIEW)
add (new SLOT VIEW (SLOT))

SLOT DATA
update
validate
data direction

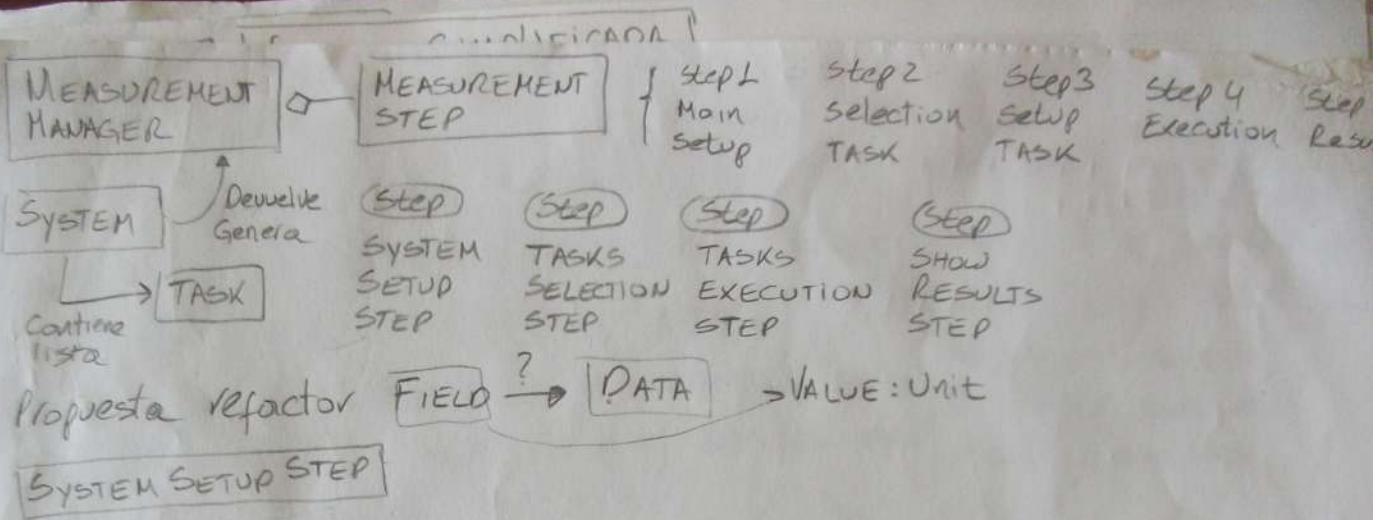
Component View Factory?

MEASUREMENT MANAGER : EVENT PUBLISHER

→ Emitir eventos para cada cambio en el ciclo de vida
de la medición

Step 1 → Step 2
eventos
carga datos → View

Fabrica Views → Component Slots View
[System Setup View] → [System Setup Step]
System Collector
Communication Setup View → Com Setup SI



CENDIT LAB

VERSIÓN SIMPLIFICADA

TAREAS DE MEDICIÓN

ENR TABLA ENR opción COMUN (ON:OFF). TABLA ENR TABLA COMUN
FORMATO TABLA { Noise Source Serial , Noise Source Model ID , Freq , ENR VALUE } TABLA CAL
INTRO ENR { TABLE, SPOT (fixed frequency) } TABLA MEAS
ENR NOISE SOURCE SETUP { SNS NORMAL } SNS AUTO LOAD { ON OFF }
ENR setting TCOLD { USER { ON OFF } SNS { ON OFF } } FILL TABLE FROM SNS
TCOLD from SNS

MEASUREMENT FREQUENCIES

Freq Modes { Sweep List Fixed } → sweep (start, stop, points)
sweep (center, span, points). Points max 401 points min 11

BANDWIDTH, Averaging BANDWIDTH { LIST, default 4MHz }
Averaging { ON, OFF } max 999 Average mode { POINT, sweep }

CALIBRATION ENTER { ENR, freq range, number points, bandwidth, averaging }
measurement mode

PROCEDURE { Load ENR table, set measurement params, connect NS }

INPUT ATTENUATION → Range { 10MHz - 3.0GHz } → { 0 - 20dB }
ATTENURATION RF { min (list) max (list) } ATTENURATION uW { default 0dB }

BANDWIDTH LIST { 100KHz 200KHz 400KHz }
{ 1MHz 2MHz 4MHz }

AVERAGING { ON OFF } AVERAGE MODE { POINT SWEEP }

MEASUREMENT MODE { Amplifier Down conv Up conv }

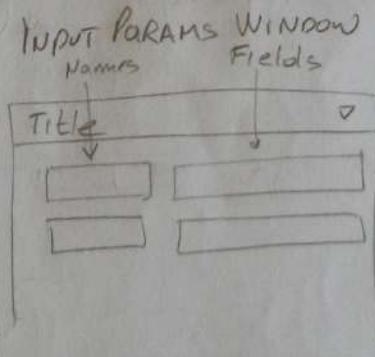
SNS TCOLD { ON OFF } → USER TCOLD { ON OFF } → USERVAL
→ User → { NS serial number, NS model ID }

ENR Table { SNS } → ENR Table { freq, ENR }

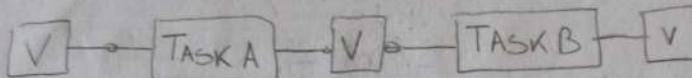
ENR Mode { Table Spot } ENR Common Table → ON → ENR TABLE
→ OFF → MEAS TABLE

FREQ MODE { Sweep LIST Fixed } → { Start F, Stop F } { Center F, Fspan }
→ { Freq LIST } { Rf Attenuation { 0: 40 dB: 5 dB } }

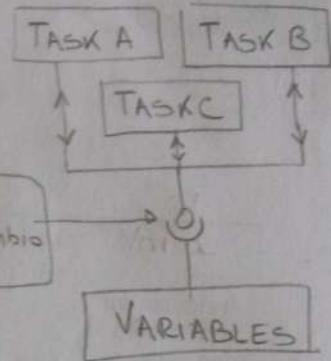
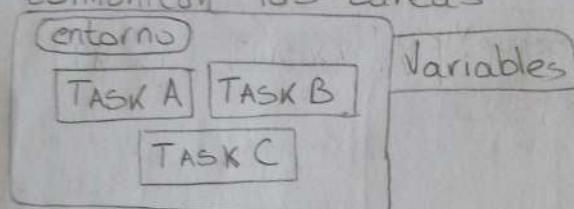
→ { Freq Field } { uW Attenuation { 0, 15, 30 dB } }



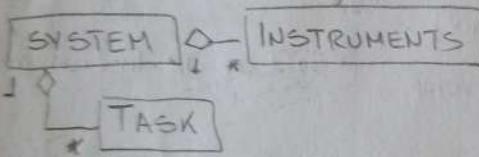
(Problema) Como separar y compartir datos de tarea de medición (objetos TASK).



Las tareas → objetos **TASK** se encuentran en un **entorno** por el cual se comunican las tareas.

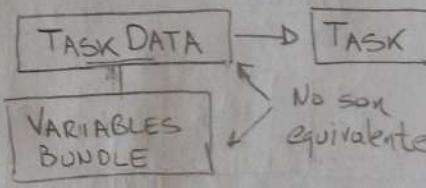


Un **SISTEMA** está formado por uno o más **INSTRUMENTOS**



Un **SISTEMA** puede ejecutar una o más **TAREAS**

Una **tarea** opera sobre **datos de tarea**



Una **tarea** debe ser lo más autónoma posible, si necesita variables de configuración

La **tarea** debe proporcionar valores por defecto.

Información requerida en variables

(Tipo)

tipos soportados
en SCPI
NR1, NR2...

(Nombre)

Cadena

Dirección

Entrada
Salida
Bi Dir

TASK DATA

→ Stack
Dictionary

→ Variables

Objeto

TASK

TASK VIEW

CONFIG VIEW

EXEC VIEW

Widget TASK SETUP

Campo para introducir nuevo valor

Campo para enlazar un valor

TASK

getInputData

getOutputData

getData()

Objetos (vistas) asociados con tarea

TASK DATA

contiene
objetos

DATA

VARIABLE



1000 NORTH MAIN STREET
MANSFIELD, TX 76063
silabs@supplier-direct.com

FEDEX TRACKING NO.	
638695084960	
INVOICE NO.	INVOICE DATE
37802410	04/27/15
CUSTOMER P.O. NUMBER	
SL4824	

CERTIFICATE OF ORIGIN

PART NUMBER	CUSTOMER PART NUMBER	HTS NUMBER	COUNTRY
CP2108-B01-GM	CONNECTION SETUP VIEW	8542.39.0000	TW
C8051F320-GQ	address → []	8542.31.0000	TW
SIM3U156-B-GQ	connect button → []	8542.31.0000	TW

DEVICE CONNECTION SETUP
device address

Device Setup → Connections
Device Setup → Parameters

select → TASK / Functions

DEV → SETUP

DEV / SYS SELECTION → sel → DEV → DEVICE VIEW → SETUP VIEW

Measurement Session → App Load

SYSTEM → HAS MEASUREMENT MANAGER → Load

Present EACH Step App

Component → System → Task

System OR Instrument?

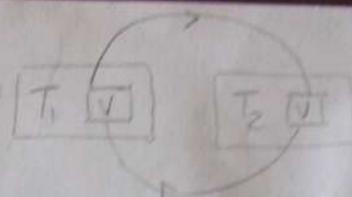
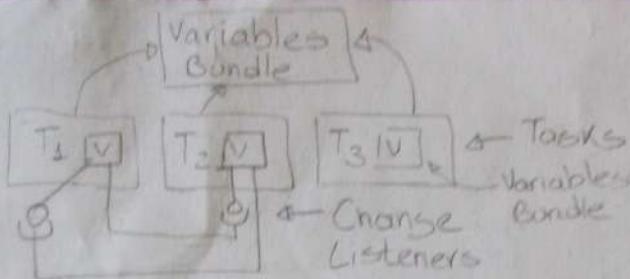
SETUP FIELDS → Task / FUNC → RESULTS

Superclass

M D Master - Detail

BLANKET PERIOD	
None - single shipment inv. # 937802410	
FROM:	_____
TO:	_____

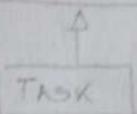
Peter Shytle
Silicon Laboratories
04/27/15
Date



Intercambio de datos entre tareas por medio de listener a variable

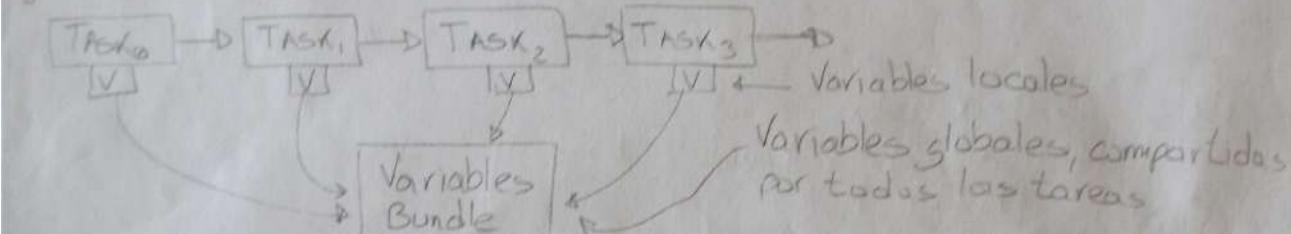
Propuesta

I Executable / una interfaz base para todo objeto TASK

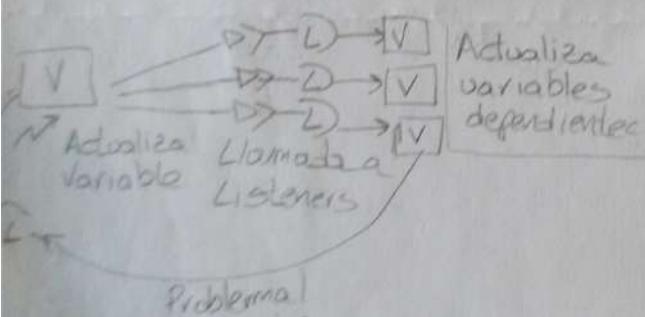


Task → objetos relativos a instrumentos
No relativos a instrumentos

Ejecución secuencial

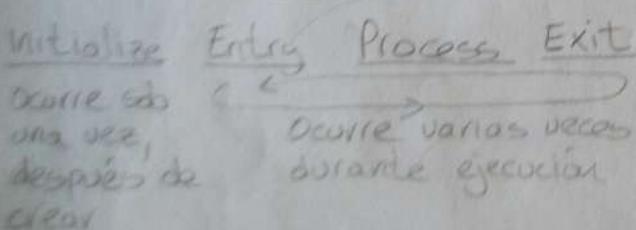


Variables globales, compartidas por todas las tareas

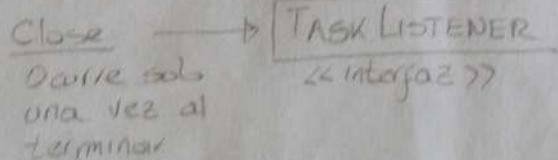


Una tarea puede tener asociada 0 o más vistas

Ciclo de vida TASK



(Signal) (Warning) (Operation) (Query) (Exception)



TASK LISTENER
«Interfaz»

04166672726

DB200 univ... .