



IR2-202 COMBO



2kW VHF FM TRANSMITTER *Single driver configuration*

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IR2-202 COMBO

2 kW VHF FM TRANSMITTER

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1. Design and Characteristics

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Associated Documents

Code	Description	SI	SE	TP	LP
902200001D	2 kW FM TRANSMITTER	X			X

Legend

SI	Interconnection Diagram
SE	Electrical Diagram
TP	Electrical Layout
LP	Part List

General description

The **IR2-202 COMBO** transmitter is used to transmit radiophonic signal for FM stereo sound broadcasting, operating in the Band II or Band I (OIRT), with 2kW output power capability and built-in exciter.

The equipment is fully compliant with the personnel safety requirements as specified in EC 215.

The transmitters is fully integrated in a compact 19" housing and is designed to offer high performances , high reliability and great simplicity in operation and maintenance procedures.

Key Features

- **BROADBAND** frequency synthesizer, without any other tuning or alignment.
- **MONOPHONIC & STEREOHONIC** emission according to the CCIR rec. 450-2 standard.
- **RDS & SCA** subcarriers input capability
- **Hi-Fi-quality** modulated signal, with low residual noise and distortion.
- **AES-EBU digital interface** available as option
- **RF Signal** free from spurious and harmonic signals
- **LD-MOS** to obtain wide band , reliability , and high efficiency.
- **Dual 1.1kW** RF power amplifier
- **Dual 1.6kW** AC/DC Power supply
- **Dual Drive ; 1+1 ; N+1** Redundancy configuration capability
- **High Tolerance** mains voltage ($\pm 20 \%$) is accepted by the transmitter
- **Remote Operation** compliant to IEC 864-1 rule ,
(Complete Remote Web Gui interface and SNMP options are available)
- **Control System** complete electronics adjust microcontrolled including fault finding
- **PROTECTION AND CONTROL SYSTEMS**
 - Block against emission on spurious frequencies
 - Reflected power
 - Modulation limiter
- **Air cooling system** fully integrated by means of three high reliability fans
- **Compact design** only one 19" rack 2 unit height is used

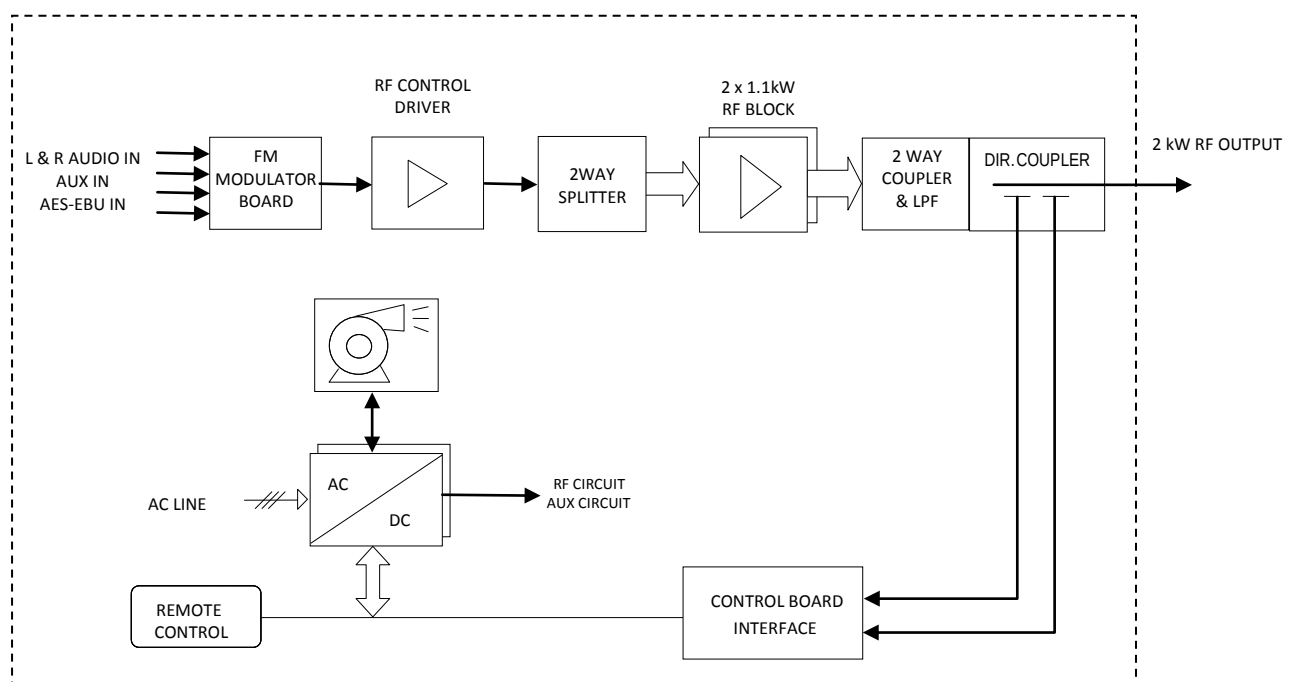
Functional Description

The functional description of the IR2-202 COMBO is made here below with reference to the Diagram shown in Figure 1.

The Stereo Sound signals and other input signals as RDS , SCA are applied to the I/O connector ass'y , present on rear panel .

The RF output signal from the Exciter is amplified , by means of a low power driver and applied to the Two Way Splitter which divides the signal in order to send it to the 2 RF amplifiers final amplifiers.

The RF output signals, coming from the two RF amplifiers , are then combined by the Two Way Coupler and then it is sent to the output through the Directional Coupler which provides a part of the Direct and Reflected Power measurement.



IR2-202 COMBO - block diagram

- **Wide-Band Amplification**

The RF amplifier is made up by two RF modules (pallets) installed in the shelf , the modules are dedicated for the Sound FM carrier amplification.

The nominal output power for each module is 1.1 kW ; the amplifiers employ solid state LD-MOS technology in order to obtain wide band , reliability , and high efficiency

- Flexible Cooling System

Is performed with forced air by means high reliability fans speed controlled , installed in the rear panel. The cooling system in fully contained in the transmitter.

- Power Supply

The power supply unit is realized with two independent AC/DC modules easy accessible .

Each AC/DC module has an individual protection against over-current and temperature , so that any failure occurred cause only a reduction of RF power , without service interruption.

The high tolerance mains voltage ($\pm 20\%$) is accepted by the transmitter , so in most situations , the Automatic Voltage Regulator is even not necessary.

- Easy Operation and Maintenance

The control system includes a fault finding for detecting equipment malfunctions and locating the faulty subassembly which need to be replaced; the basic controls as Start - Stop - Standby - Reset and power readout are permanently available.

- Control System

Visual mode display is designed to allow readings of numerous important parameters of the Transmitter. It is possible to visualize parameters and other stored data without making changes while Transmitter is operating normally. Visual mode is intended for consultation only and therefore described first in the sequence



Visual/Program/Special modes. To ensure optimum reading the LCD is placed in the front panel, it contains two rows holding sixteen characters and visualizes the information listed below by simply rotating the encoder.

- Interlock

The interlock circuit is independent of the of the control system and remains always operational by means of the hardware wire.

Technical specifications**GENERAL**

• Frequency range	87.5 to 108 MHz
• Class of emission	F3E (Monophonic) F8E (Stereophonic)
• Stereo system	According to C.C.I.R. rec.450-2
• Frequency deviation	± 75 kHz nominal
• Frequency control	Built-in Frequency Synthesiser
• Resolution	10 kHz step programmable
• Frequency stability	± 500 Hz / 6 months
• Output power	2 kW (0.5 to 2kW adjustable)
• Harmonic emission	≤ 70 dBc
• Spurious emission	≤ 90 dBc
• Residual AM noise level	≤ 60 dB
• Synchronous AM	≤ 50 dB
• RF output impedance	50 Ω (7/8" EIA connector)

ENVIRONMENTAL

• Operating temperature	– 5 °C to 45 °C
• Relative humidity	20% to 90% non-condensing
• Altitude	up to 2500 m.

PROGRAM INPUT

• Mono/Stereo	L & R program input
• Connector	XLR type
• Impedance	600 Ω balanced
• Level	– 4 to 12 dBm
• Preemphasis	50 or 75 µs selectable
• Audio frequency response	40 to 15000 ± 0.3 dB
• 19 kHz suppression	≥ 50 dB
• RDS and AUX	Subcarrier program input
• Connector	BNC
• Impedance	≥ 2 kΩ unbalanced
• Frequency range	67 to 100 kHz
• Nominal input level	– 10 dBm (± 7.5 kHz deviation)

TRANSMISSION CHARACTERISTICS**Mono operation ± 75 kHz deviation**

• Total harmonic distortion	≤ 0.1%
• Intermodulation	≤ 60 dB
• Signal to noise unweighted	≥ 80 dB
• Signal to noise weighted (CCIR 468-3)	≥ 78 dB

Stereo operation ± 75 kHz deviation

• Total harmonic distortion	≤ 0.1%
• Intermodulation	≤ 60 dB
• Signal to noise unweighted	≥ 78 dB
• Signal to noise weighted (CCIR 468-3)	≥ 72 dB
• Crosstalk L & R (40 to 15000 Hz)	≥ 50 dB
• 38 kHz subcarrier suppression	≥ 50 dB
• Attenuation above 53 kHz	≥ 50 dB

METERING

The following parameters can be read on front display

- Forward power (FWD)
- Reflected power (REF)
- DC Supply voltage
- Frequency (active channel)
- Frequency (stored channels 1 to 6)
- Mono and stereo sensitivity (0,25 dB step)
- Programmed output power
- MPX peak modulation
- L & R peak level
- RDS, SCA, Aux, MPX external modulation
- Programmed audio parameters (+L or -L, +R or -R, L on/off, R on/off, Pre-emphasis lin, 50, 75 μ sec, Limiter on/off, Input Impedance Z=10kOhm/ 600 Ohm)
- Alarm status
- Memory status
- Internal voltage
- Serial Number

REMOTE CONTROL

Parallel interface: start, stop, standby, alarms,
status, interlock, recall memory

WEB interface: TCP/IP Telemetry/SNMP (option)

GENERAL

Voltage power supply: 220 V AC $\pm$ 15 %
(other on request)

Frequency: 50 - 60 Hz $\pm$ 5 %

Power consumption
(cooling system included) : $\leq$ 2.8 kW

Power factor: $\geq$ 0.9

Cooling: forced air

Dimensions: 483 x 88 H x 674 mm

Weight: 14 kg approx.

OPTION

Digital audio Input: AES-EBU facilities XLR balanced (S/PDIF)

RDS : RDS simple coder programmable via PC

OIRT Version: band of frequency 65.80 to 74.00 MHz

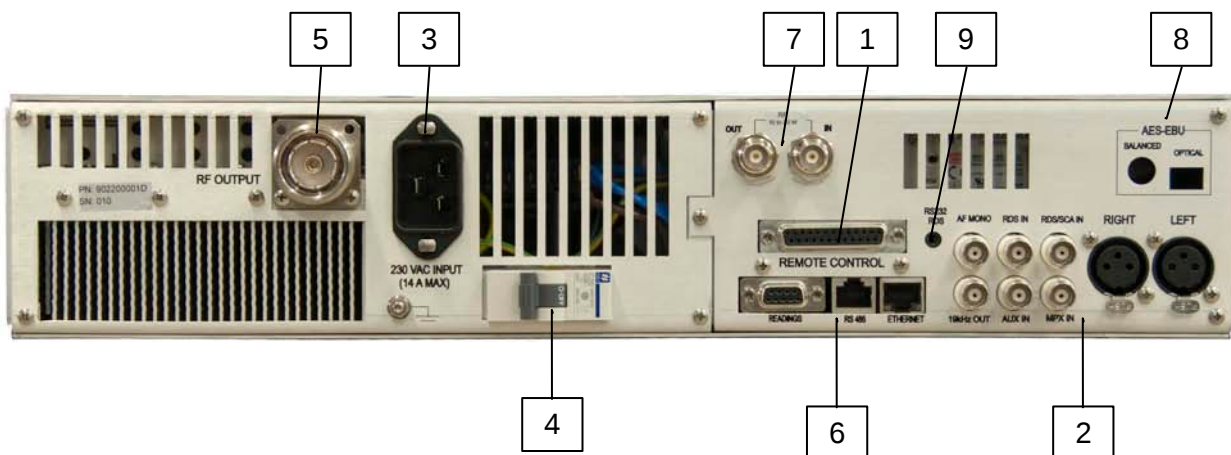
Mechanical Layout - Fig.2

Front Panel view



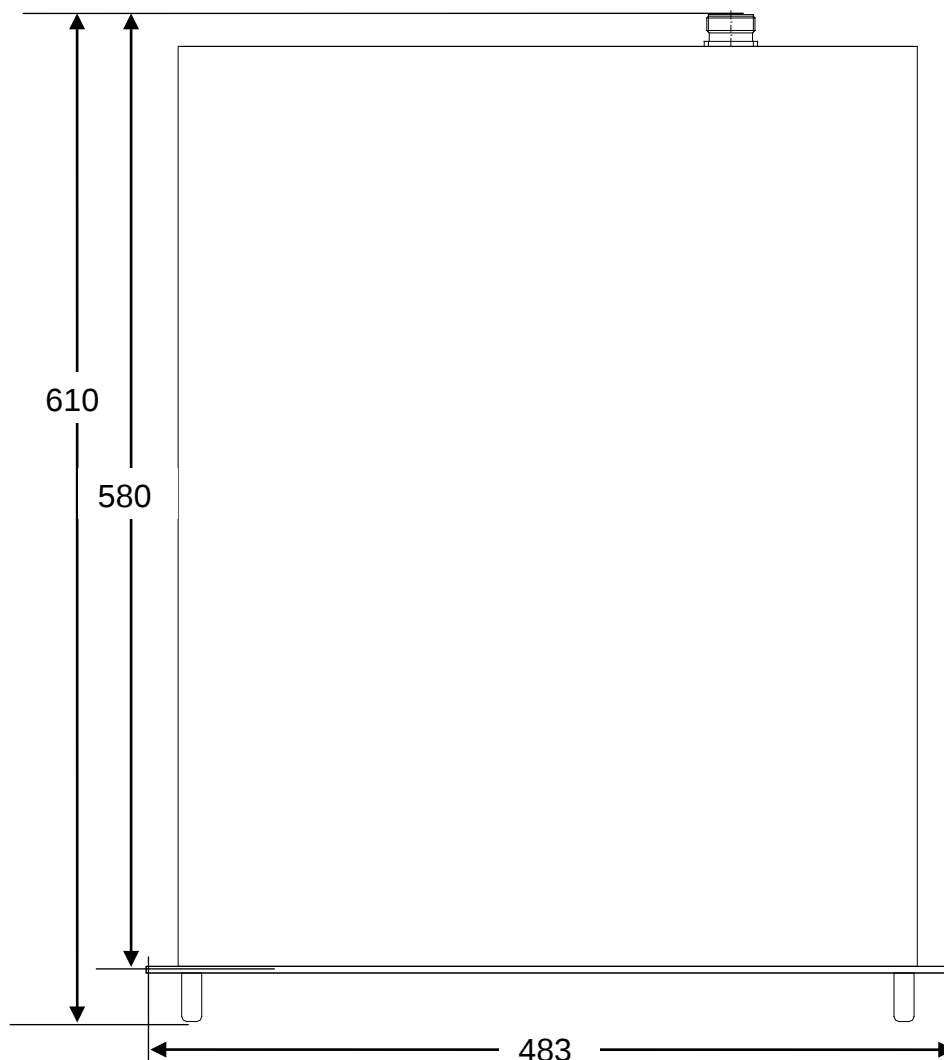
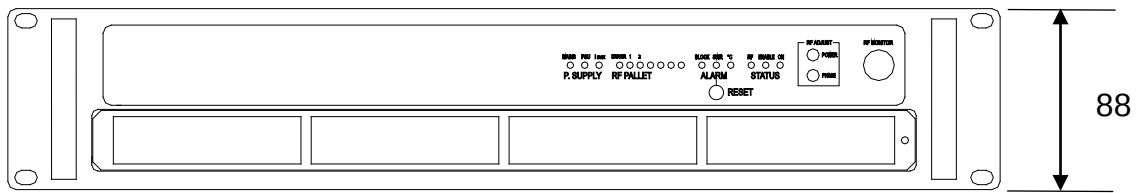
Nr.	Description	Nr.	Description
1	USB Port	6	Standby Pushbutton
2	Control Display	7	Alarm Reset
3	Rotary Selector	8	RF Monitor
4	Alarm synoptic	9	Air Inlet grid
5	Status synoptic	10	Handles

Rear Panel view - Fig.3



Nr.	Description	Nr.	Description
1	Remote Control	4	Main Braker
2	AF Inputs and Auxiliary	5	RF Output
3	AC Mains Power Input	6	RS-485 / TCP-IP Interface (optional)
7	RF Loop (Exciter OUT – Amp IN)	8	Digital I/O (optional)
9	RDS (optional)		

Installation layout Fig.4
(measure in mm)



Installation Requirement

This section explain how to install and configure the apparatus for your location. All internal switching and set-up should be done by qualified service person.

Parameter	Requirement			
Installation Area	It must be clean and free of dust , the transmitter must be installed to have space around enough for ventilation and for maintenance actions to be allowed. The minimum requirement space for transmitter must be : 1 x 2 x 2 (H) meter			
Temperature	Room temperature does not exceed : – 5 to 45 °C			
Electrical Plant	The main power installed must be : ≥ 3.5 kVA			
Feeder line	EIA 7/16" Coaxial Cable			
Antenna System	It must be 50Ω with Return Loss : ≥ 20dB at working frequency			
Main Voltage	AC voltage must be : Nominal value ± 15 %			
Main Power cable size (mm ²)	Operation voltage	Phase wires	Neutral wire	Protection earth wire
	208 to 240	≥ 15	not used	≥ 15
Air Cooling	If the transmitter is installed without inlet air duct the room must be capable of : 1500 m³/ h air flow			

2. Installation Procedure

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- Amplifier Arrangement
- Antenna Feeder
- Wiring the Amplifier
- AC Voltage Set-Up
- Electrical Interface
- Remote Operation
- Put in Operation

- **Amplifier Arrangement**

Install the amplifier drawer inside the own slot , make attention to insert on the left and right bracket , mounted before. Then push kindly the module by means the handles, until the complete insertion in the slot.

Complete the drawer fixing , with four M5 screws insertion on front panel and locks it to the rack mountings.

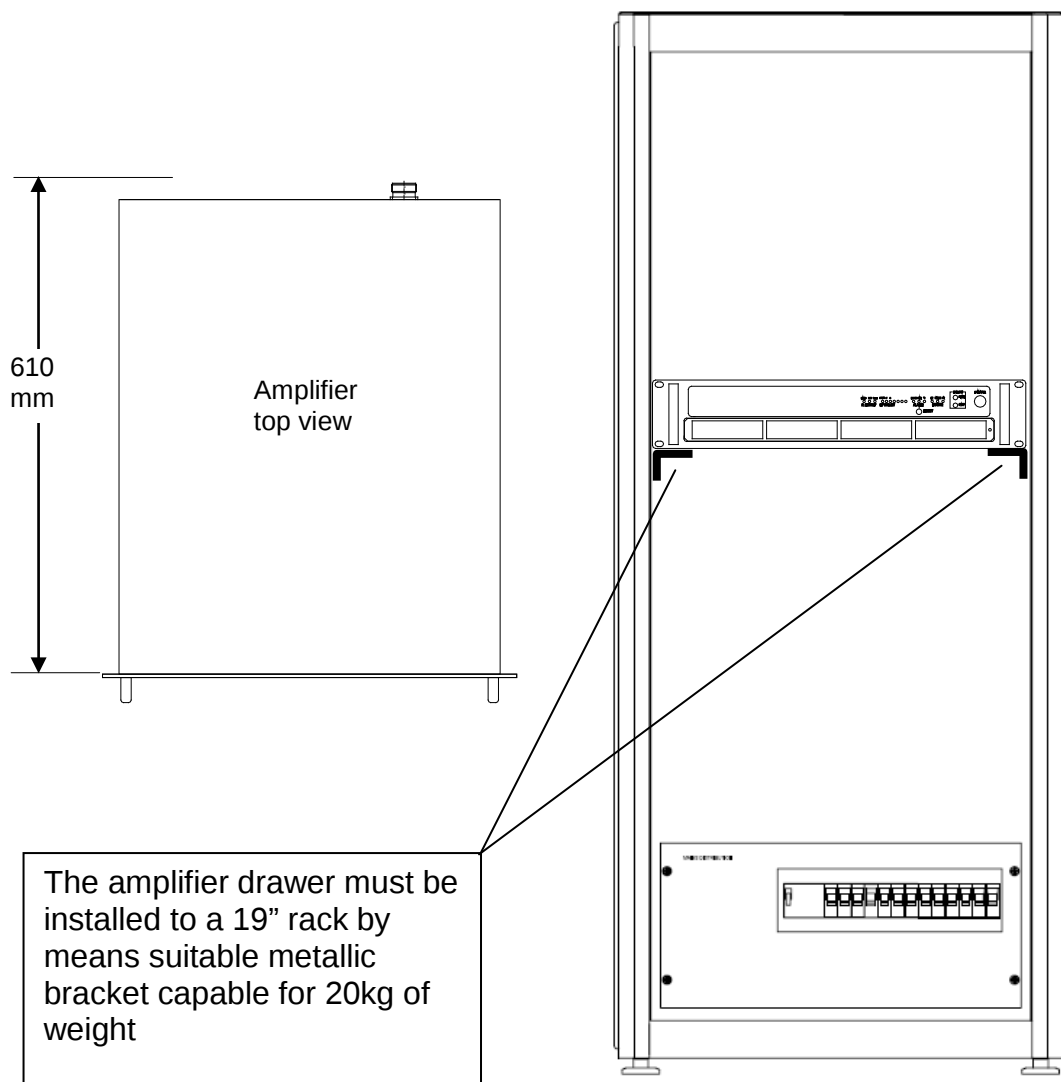


Fig.1 Typical amplifier arrangement inside rack

- **Antenna Feeder**

The Amplifier RF output interface is EIA 7/16", others interface can be supplied on request in order to match the antenna feeder and RF output.

Before connection operation check the RETURN LOSS of the antenna system , it must be ≥ 20 dB at all working frequency.

- **Wiring the Amplifier**

Grounding

The equipment must be grounded by a suitable wire connected to the AC Mains Power Input Connector supplied.

Additional grounding wire can be connected to the proper terminal screw present in the rear panel .

SAFETY INFORMATION

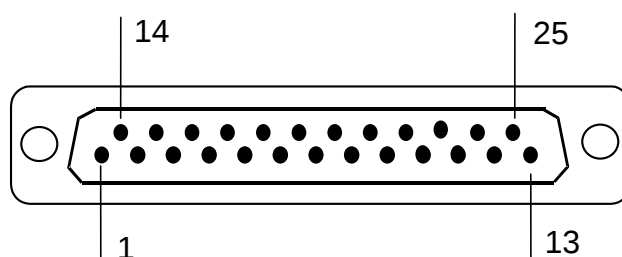
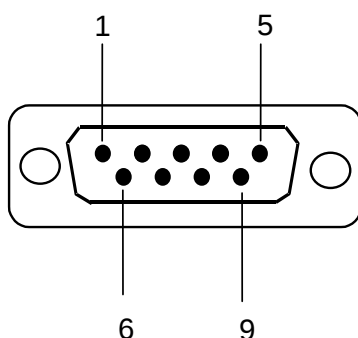
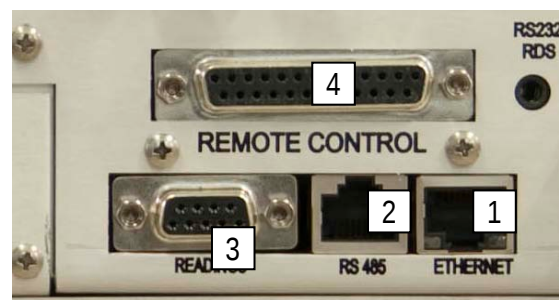
WARNING 208 - 240 VOLTAGE

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present

- **Electrical Interfaces**

The electrical interfaces are available in a connector DB25 female installed in the rear panel rack drawer, the circuit provides to connect the transmitter with Remote Controls.

- 1) RJ45 for TC/IP Connection (Optional)
- 2) RJ45 for RS 485 Connection
- 3) DB9 connector Readings
- 4) DB25 Connector - Remote Control



Remote Operation

A remote control facility for the operation and maintenance of the transmitter is available, this can provide the full management , diagnostic and status of the equipment.

DB25					
TC = TELECONTROL; TA = TELEALARM; TS = TELESIGNALLING					
Pin	Description	Acronyms	Type	I/O	Value @ & Operating Capability
1	Interlock Output – changes status when Amp is in 'Fault'. Inhibits Exciter or other equipment	OUT-INTRLK	Control (TC)	➔	Open Drain, 20V max 20mA max. Pin can be set Normal open/Normal close; Ron =5 Ω
2	Acknowledge – changes status when Amp is in 'Wait'	ACK-WAIT	Signal (TS)	➔	Open Drain, 20V max 20mA max. Pin can be set Normal open/Normal close; Ron =5 Ω
3	Not Used	--	--	--	--
4	Not Used	--	--	--	--
5	Not Used	--	--	--	--
6	Alarm Reset – resets alarm memory when temporarily connected to ground	ALARM-RST	Control (TC)	⬅	200 mSec pulse from open to ground; 1mA; < 100 Ω
7	Not Used	--	--	--	--
8	TX Off – switches off Amp remotely	TX-OFF	Control (TC)	⬅	200 mSec Pulse from open to +9 Volt (Pin 25) 1mA; < 100 Ω
9	Interlock Input – if not continuously connected to or open from ground depending on selection: N.O or N.C causes 'Wait'	EXT-INTRLK	Control (TC)	⬅	Contact resistance < 100 Ω
10	Set Memory # 6 (*) pin selects memory if continuously connected to ground	M6	Control (TC)	⬅	Contact resistance < 100 Ω
11	Set Memory # 4 (*) pin selects memory if continuously connected to ground	M4	Control (TC)	⬅	Contact resistance < 100 Ω
12	Set Memory # 2 (*) pin selects memory if continuously connected to ground	M2	Control (TC)	⬅	Contact resistance < 100 Ω
13	GROUND – pin is connected to ground	GND	Ground	--	Ground
14	General Alarm – changes status when Amp is in 'Fault'	FAULT	Alarm (TA)	➔	Open Drain 20V max 20mA max Ron =5 Ω
15	Not Used	--	--	--	--
16	GROUND – pin is connected to ground	GND	Ground	-	Ground
17	Not Used	--	--	--	--
18	Acknowledge – ON changes status when Amp is ON	ACK-ON	Signal (TS)	➔	Open Drain 20V max 20mA max Ron =5 Ω
19	1= Local 0= Remote	LOC-REM	Signal (TS)	➔	Open Drain 20V max 20mA max Ron =5 Ω
20	TX On – switches on Amp remotely	TX-ON	Control (TC)	⬅	200 mSec Pulse from open to +9 Volt (Pin 25) 1mA; < 100 Ω
21	Not Used	--	--	--	--
22	Set Memory # 7 (*) pin selects memory if continuously connected to ground	M7	Control (TC)	⬅	Contact resistance < 100 Ω
23	Set Memory # 5 (*) pin selects memory if continuously connected to ground	M5	Control (TC)	⬅	Contact resistance < 100 Ω
24	Set Memory # 3 (*) pin selects memory if continuously connected to ground	M3	Control (TC)	⬅	Contact resistance < 100 Ω
25	Auxiliary Power Supply Output	+9V	Output	➔	+9 Volt/100mA max
Symbols: ➔ Output ⬅ Input					

TELEMETRY DB9					
Pin	Description	Acronyms	Type	I/O	Value @ / Impedance
1	GROUND –	GND	Gnd	-	
2	Current reading – reads power Amp current	IPA	Analog value	➡	3.0V/200A Internal impedance > 100Ω
3					
4	Forward Output Power – reads Forward RF Output power	OUT-FWD-MEAS	Analog value	➡	3.0V/2000W Internal impedance > 100Ω
5	Temperature – reads incoming air temperature	TEMP-AIR-MEAS	Analog value	➡	2.0V/80°C Internal impedance > 100Ω
6	Voltage reading – reads voltage supplied to power Amp	VPA	Analog value	➡	3.0V/48V Internal impedance > 100Ω
7					
8	Output Reflected Power – reads Output reflected power	OUT-REF-MEAS	Analog value	➡	3.0V/200W Internal impedance > 100Ω
9	RF Temperature – reads RF heat sink temperature	RF-TEMP-MEAS	Analog value	➡	1.0V/100°C Internal impedance > 100Ω
Symbols: ➡ Output ◀ Input					

• Put in Operation

After installation procedure execution, proceed to the following operations described below. Detail instructions are present on this manual and will be recalled in the relevant chapter as shown on this table.

Point	Description	Reference Manual (<i>italic</i>)
0	Start Amplifier	Main Breaker ON <i>Chapter 4 / Rear Panel</i>
1	Set the level of RF power input	Adjusting from front panel Display <i>Chapter 3 / Section 3</i>
2	Set the working frequency	<i>Chapter 3 / Section 3</i>
3	Complete Procedure of the Transmitter Set-up regarding: • Audio Settings • Sensitivity • Input Impedance • Pre-Emphasis Settings • Limiter Setting • POWER ON/OFF • RECALL/SET e Memory • Memory Setting • Presetting	<i>Chapter 3 / Section 3</i>

3. FM Exciter Section

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Associated Documents

Code	Description	SI	SE	TP	PL
SDM01000C	FM EXCITER MAINBOARD		X	X	

Legend

SI	Interconnection Diagram
SE	Electrical Diagram
TP	Electrical Layout
PL	Part List

Section 1

INTRODUCTION & GENERAL INFORMATION

About This Manual

A step-by step guide to simple installation and setup of Transmitter ,the manual contains the following sections:

- 1. Introduction & General Information:** current section
- 2. Visual Mode:** how to read main parameters and settings (consultation only)
- 3. Program Mode:** how to program main parameters and settings
- 4. Service & Maintenance:** component location, and other technical information

Symbols

This section contains a list of most commonly used symbols.

It is important to become familiar with symbols to understand the information contained in the manual. Additionally, some graphical signs are used to draw further or extra attention to specific operations.

This manual is divided into two main sections: use of equipment and maintenance. The two sections are separated by one blue page. The operator who has experience in using the equipment must not try to perform any maintenance operation.

Any incorrect operation may cause damage to electronics and be also potentially dangerous for operator's safety.



This symbol means: "Notice"



This symbol means: "Read carefully before operating"



This symbol means: "Please contact Manufacturer"



This symbol means: "Information relevant to the Software"



This symbol means: "Maintenance Procedure"



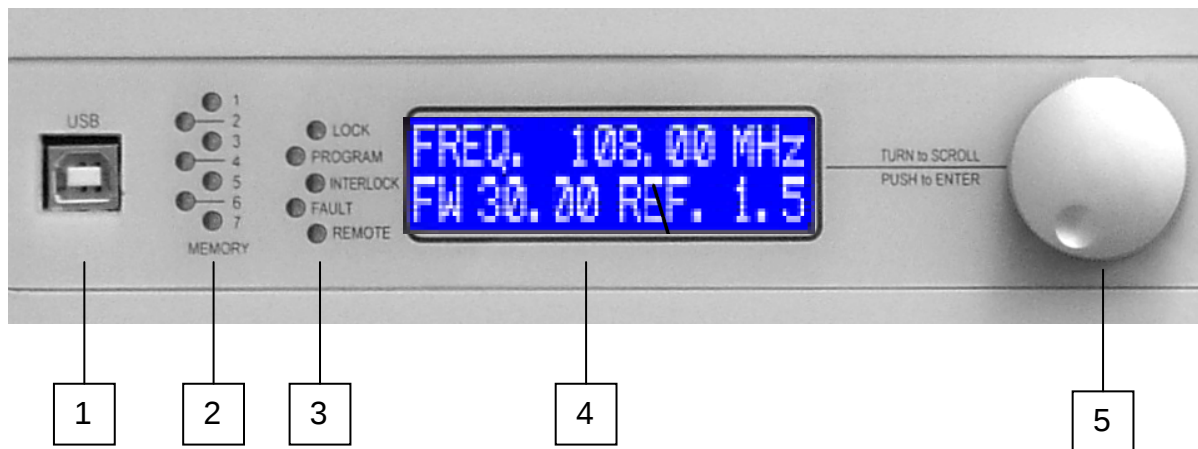
This symbol means: "DANGER !"

Meter Readings

The following parameters can be read on front display

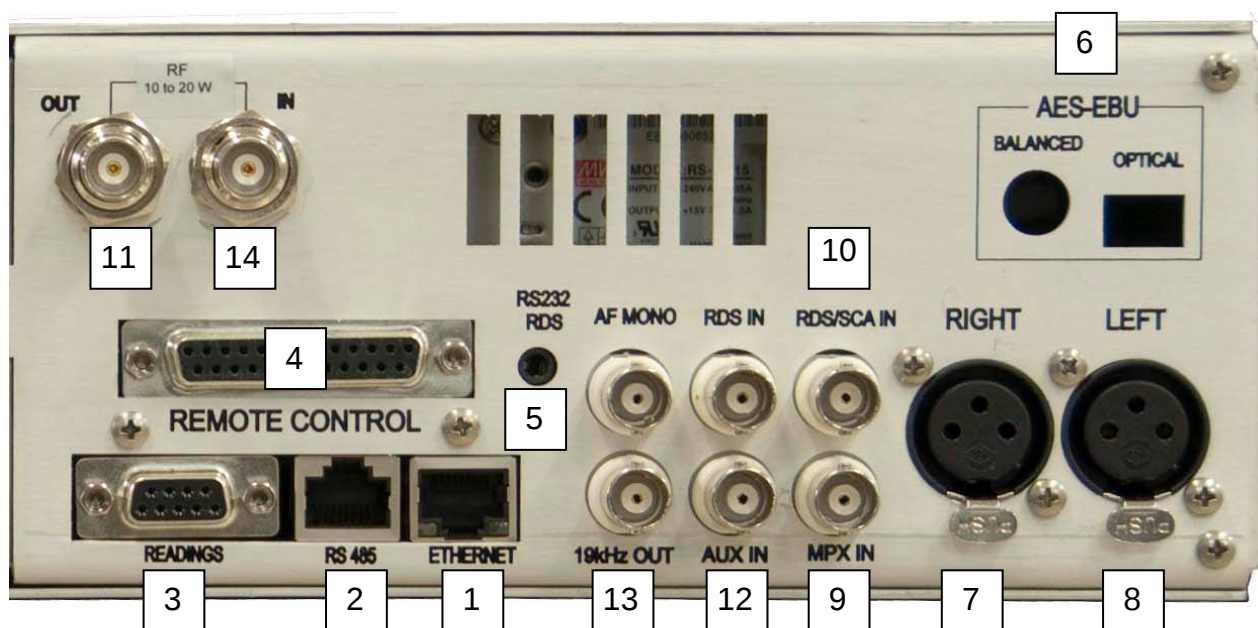
- ❑ Forward power (FWD)
- ❑ Reflected power (REF)
- ❑ DC Supply voltage
- ❑ Frequency (active channel)
- ❑ Frequency (stored channels 1 to 6)
- ❑ Mono and stereo sensitivity (0,25 dB step)
- ❑ Programmed output power
- ❑ MPX peak modulation
- ❑ L & R peak level
- ❑ RDS, SCA, Aux, MPX external modulation
- ❑ Programmed audio parameters (+L or -L, +R or -R, L on/off, R on/off, Pre-emphasis lin, 50, 75 μ S, Limiter on/off, Input Impedance Z=10KOhm/ 600 Ohm)
- ❑ Alarm status
- ❑ Memory status
- ❑ Internal voltage
- ❑ Serial Number

Front Panel



Nr.	Description	Remark
1	USB Port	Allows a PC connection
2	Memory Activation Indicator	Indicate Memory Status
3	Status	LOCK: The green LED indicates that transmitter PLL is locked PROGRAM: The red LED indicates that <i>program mode</i> is active and the operator must be alert INTERLOCK: The yellow LED indicates that transmitter is interlocked (For Stand-Alone device INTERLOCK is setting on Normal Open) FAULT: The red LED indicates a fault occurred REMOTE: The yellow LED indicates that transmitter is managed remotely
4	LCD Display	Two- row, sixteen-character LCD Display
5	Control Knob	Rotary Encoder to scroll the sub-menus, selection and modification parameters

Rear Panel



Nr.	Description	Remark
1	ETHERNET	RJ45 for TC/IP Connection (Optional)
2	RS485	RJ45 for RS 485 Connection (Optional)
3	READING	DB9 connector for telemetry (detail pin-out is described on <i>Chapter 2 / Remote Operation</i>)
4	REMOTE CONTROL	DB25 Connector for Remote Control telemetry (detail pin-out is described on <i>Chapter 2 / Remote Operation</i>)
5	RS232-RDS	The jack socket for connecting the RDS (Optional)
6	AES-EBU	Optical/Balanced Input (Optional)
7	RIGHT channel	XLR female Balanced Input
8	LEFT channel	XLR female Balanced Input
9	MPX	BNC connector Input
10	SCA	BNC connector Input
11	OUT (10W)	BNC connector RF Output (linked to IN 10W connector)
12	AUX	BNC connector Input
13	19kHz	BNC connector Output
14	IN (10W)	BNC connector RF Input

AUDIO INPUTS				
Function	Input level / Adjustment range	BW	Impedance	Mode
MPX	+2 to +18dBm 0.5 dB step adjustable by software	0.15 dB 30 Hz÷100kHz	~5 kΩ	Unbalanced
SCA	0 to -16dBm 0.5 dB step adjustable by software	0.15 dB 40kHz÷100kHz	~3 kΩ	Unbalanced
AUX	0 to -16dBm 0.5 dB step adjustable by software	0.15 dB 40kHz÷100kHz	~3 kΩ	Unbalanced
L	+2 to +18dBm± 0.5 dBm 0.5 dB step adjustable by software and fine Adj by trimmer on rear panel	0.1 dB 30Hz÷15kHz	15 kΩ 600 Ω	Balanced
R	+2 to +18dBm± 0.5 dBm 0.5 dB step adjustable by software and fine Adj by trimmer on rear panel	0.1 dB 30Hz-15kHz	15 kΩ 600 Ω	Balanced

OUTPUT	
Pilot	BNC connector 19 kHz Square wave, level 1 Vpp, impedance >5kΩ, unbalanced type

Description of the Encoder Knob

The **encoder knob** located on front panel is the main access to control transmitter in conjunction with display readings. It rotates clockwise or anticlockwise, and can be pushed. The overall procedure to browse through the different menus is very intuitive.

The LCD display shows **two rows with sixteen characters** and a number of different menus. Three operating modes are possible:

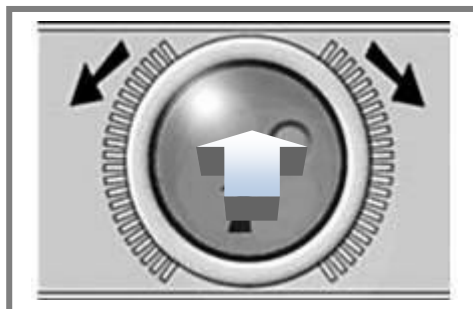
visual only mode: it reads set values or parameters
program mode: it sets up parameters and/or other values to modify
special program: it resets power and upgrades firmware

In all cases when turning the encoder knob and the indication "**Push to Program**" appears on display it is possible to modify parameters. This simple message "Push to Program" is the basic way to select and store.

A description of all available menus displayed on the LCD is reported in the following sections. It is important to remember that:

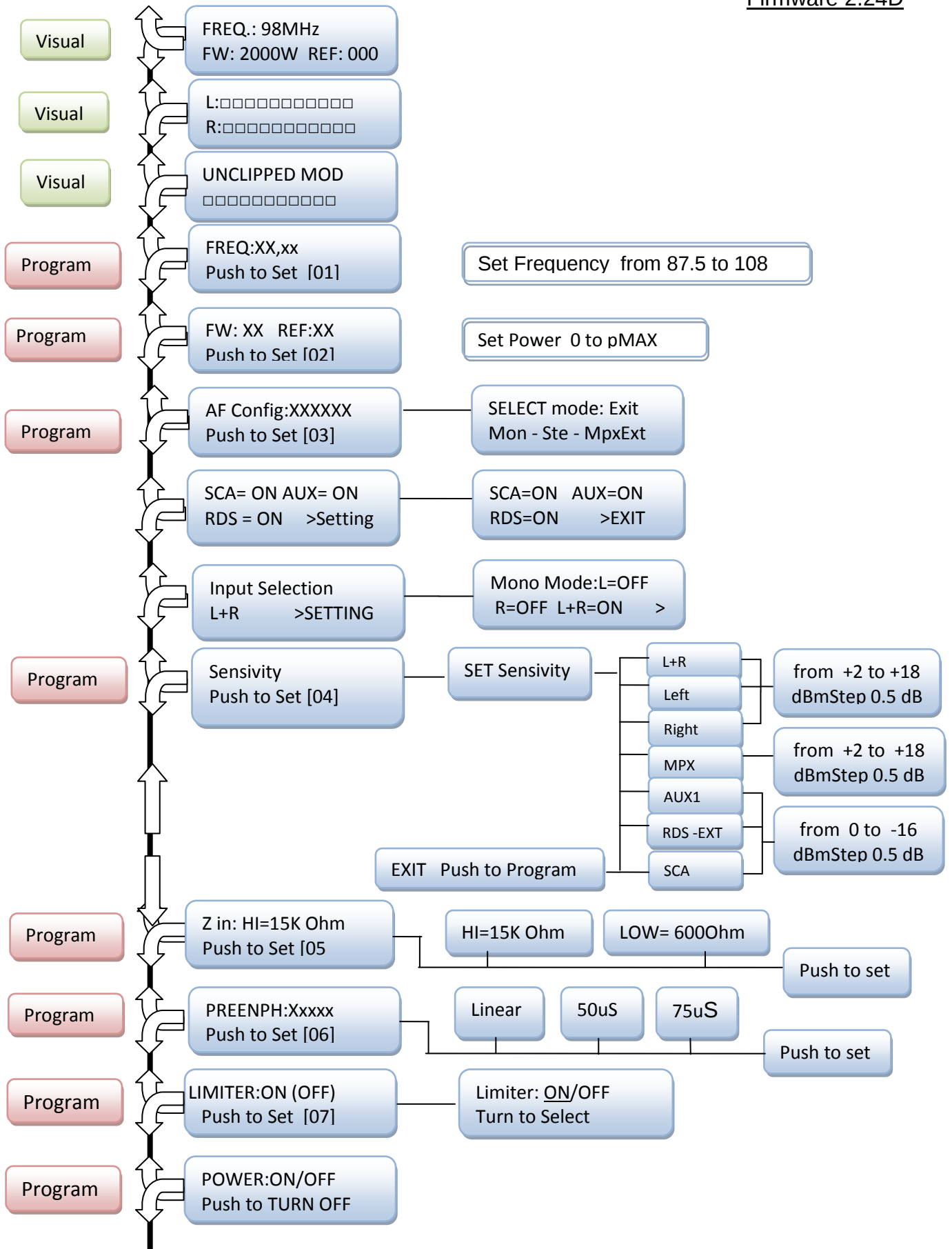
By rotating the knob: you scroll the sub-menus, increase or decrease a given value

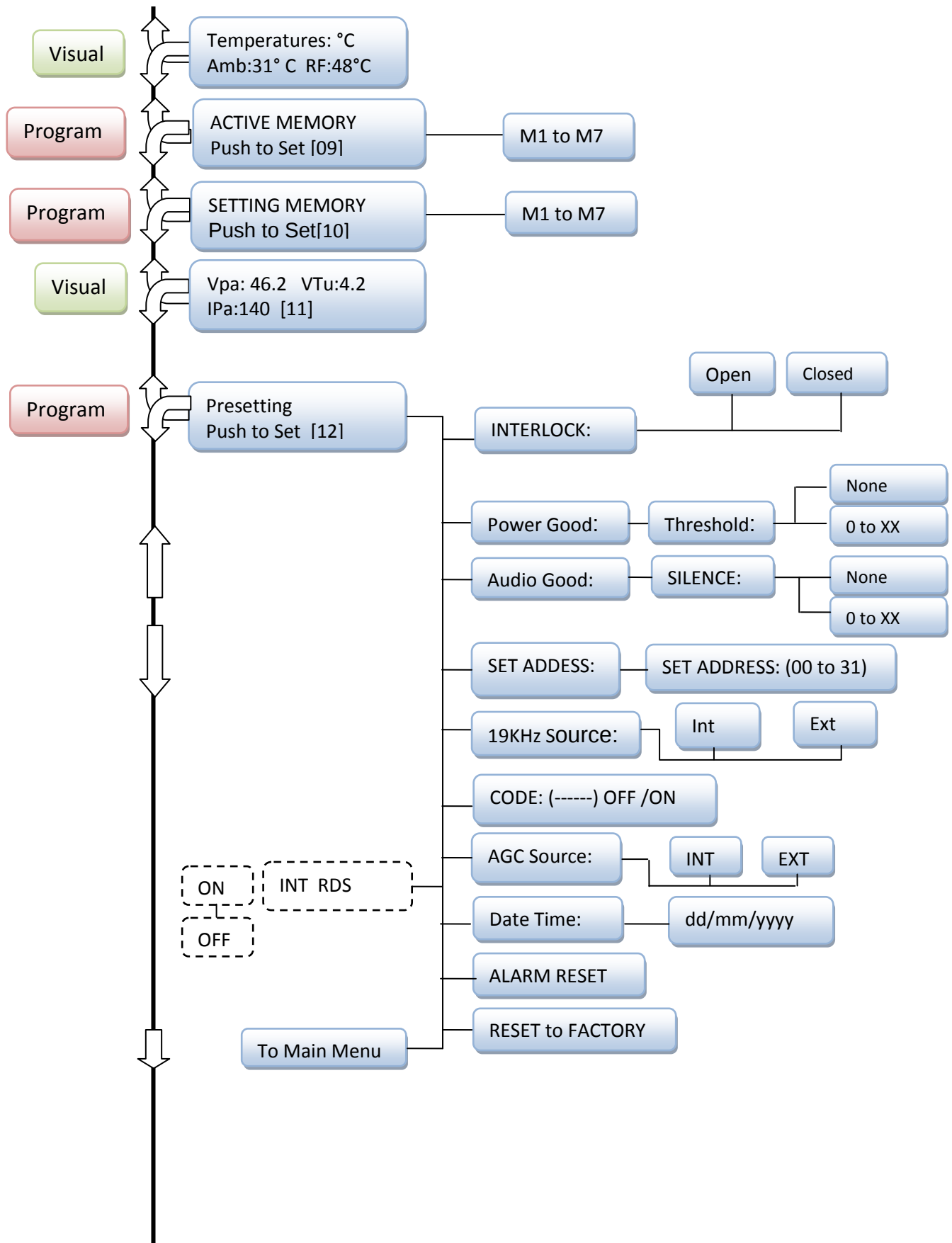
By pushing/pressing: you select parameters to modify you store values and confirm selection

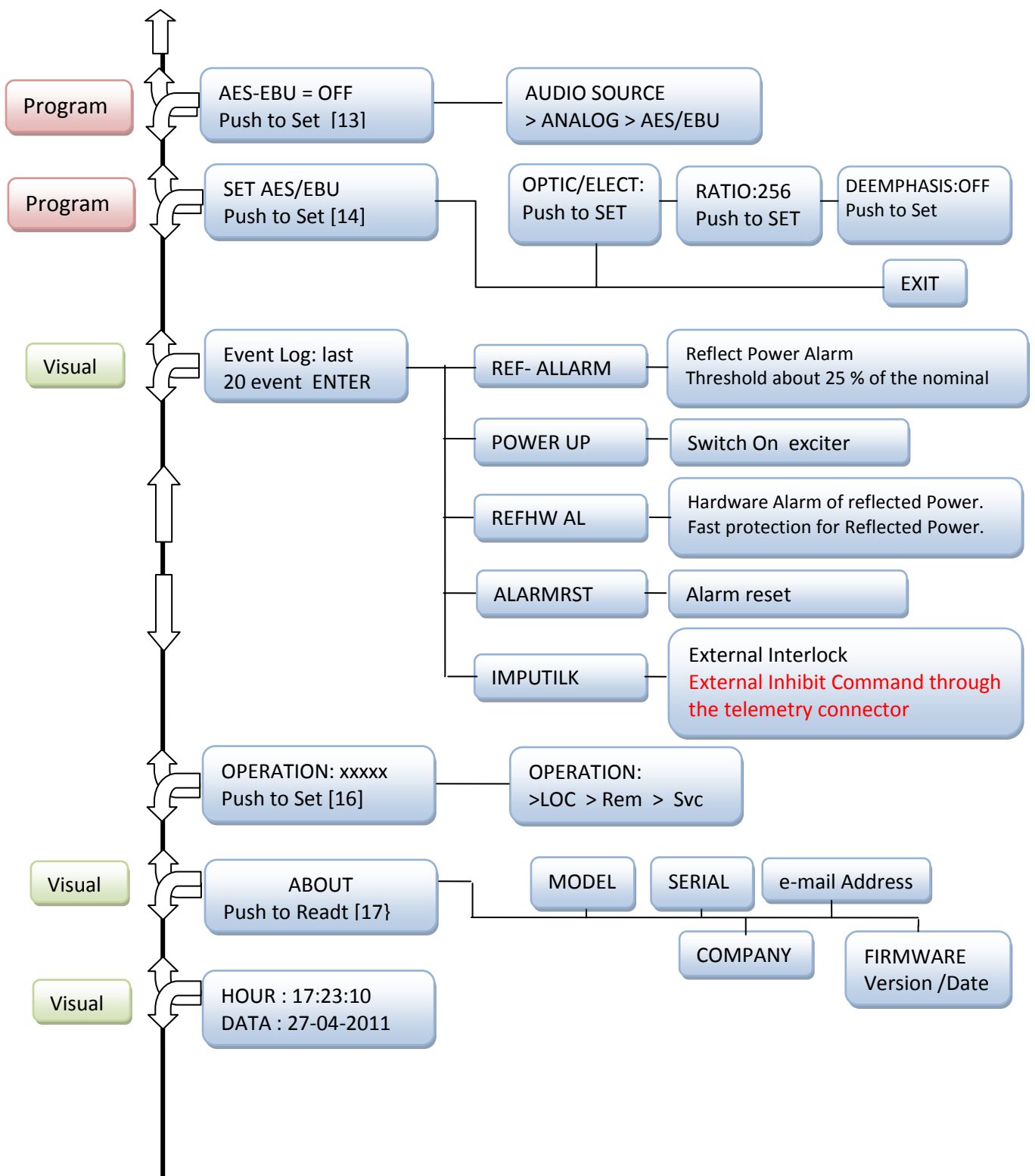


Flow chart Encoder Knob

Firmware 2.24D







Switch On

After installation procedure execution, proceed to the following operations described below. Detail instructions are present on this manual and will be recalled in the relevant chapter.

The first slide on display reads

F	R	E	Q	:		9	9	.	0	0		M	H	z	
F	W	:	2	0	0	0			R	E	F	:	0	0	0

The PLL (Phase Locked Loop) starts the lock-in process which takes 4-5 sec. approximately (depending on the frequency) to capture the oscillator at the programmed frequency



Very Important Notice!

After the PLL locks RF power ramps up to the programmed value. If you want to reset the previously stored value of RF power you must switch OFF the transmitter. After that, **switch ON** and **simultaneously** keep the knob pressed. In this particular case the RF power is forced to 0 W and the first slide is (see: "Special Mode Program")

R	F		F	W	D		W	:			0	.	0	0	
F	W	:			0	.	0		R	E	F	:	0	.	0

The slide can set the desired RF power by rotating the encoder. Move cursor under YES to confirm and close the power setting by pushing the encoder knob

		A	R	E		Y	O	U		S	U	R	E		
						N	O	/	Y	E	S	?			

When selection is made

				L	O	A	D	I	N	G					
TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

The microcontroller stores data in the flash memory and value is set

Setting Memories

Our software stores all parameters in seven different memories from M1 to M7. Only one memory at a time is active and can control the transmitter.

All operating parameters or any other value such as power output or audio sensitivity can be stored in any of the seven memories.

The programming operation does not affect the active (working) memory. When data setting is completed data can be saved.

All data will be changed simultaneously if you activate a memory other than the one previously in use. Memory status is indicated by a green/yellow LED

Default memory (Memory 1) is indicated by first LED starting from top.

From memory setting MENU shown in display you can select a different memory (from Memory 2 to Memory 7 via encoder knob or by remote control).

Each selected memory is indicated by corresponding LED.

The switching of a yellow LED shows which memory you are loading. Loaded memories are recalled by using memory activation menu in which case LED for active memory becomes green.

If modified data is saved in the active memory change will be operational when programming is completed (data is stored and program mode is closed).

RF output power control has two (2) different operating modes.

- First to program RF power in the active memory. You enter the desired power value which changes in real time.
- Second to program power in a non active memory. You enter power value and value is stored and becomes operational when memory is activated.

Memories can be activated in three different ways:

- Via the Encoder Knob as explained
- Via the DB25 rear connector (Exciter in “remote” mode)
- Via web interface option if it is present (Exciter in “remote” mode)

Section 2

VISUAL MODE OPERATION

Various Menus

Visual mode is designed to allow readings of numerous important parameters of the Exciter and power amplifier.

It is possible to visualize parameters and other stored data without making changes while Exciter is operating normally.

Visual mode is intended for consultation only and therefore described first in the sequence Visual/Program/Special modes.

To ensure optimum reading the LCD is placed in the central section of the front panel, it contains two rows holding sixteen characters and visualizes the information listed below by simply rotating the encoder.

Audio Reading Pages

The Audio menu shows the slides described below.

Left & Right bars show peak modulation. The ten filled square blocks indicate 10% each (7.5KHz) of the permitted deviation (75kHz). Four empty blocks show over-modulation

L	:	TM	TM	TM	TM	TM	TM	TM	TM	TM	□	□	□	□	□	□
R	:	TM	TM	TM	TM	TM	TM	TM	TM	TM	□	□	□	□	□	□

2) Unclipped Modulation

U	N	C	L	I	P	P	E	D		M	O	D				
TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	©	©	©	©			

Other Parameter Reading Menù

3) TEMPERATURES of the Ambient and RF STAGE

	T	e	m	p	e	r	a	t	u	r	e	s							
A	m	b	:	2	5	°		R	F	°	4	4							

1) VPA-APC-IPA

V	p	a	:	4	8	.	0		V	T	u	:	4	.	5				
I	P	a	:	0	6	2													

This is the voltage that controls the PLL in order to stabilize the frequency. A value between 2 and 4V can be accepted. A typical value is 3.3 to 3.6V.

Values out of specified range indicates a possible failure.

		I	P	A	:		0	6	2			A							
		P	U	S	H		T	O			E	X	I	T					

It indicates the current absorbed from the RF power stage. IPA current is the result of the driver and the power amplifier supply consumption. The RF driver section absorbs approx. 300mA. To evaluate the final amplifier current you must simply subtract 300mA from the total IPA current

The nominal current is as follow:

IPA @ 1000W is 30A

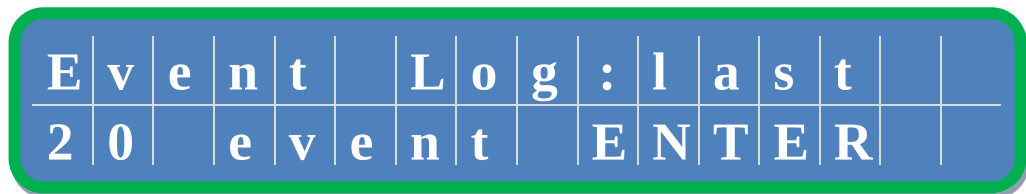
IPA @ 2000W is 60A

To exit slide push encoder knob and the following slide indicates menu is being shut

TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

Event Log Reading Menù

The following slide shows the log of 19 event last

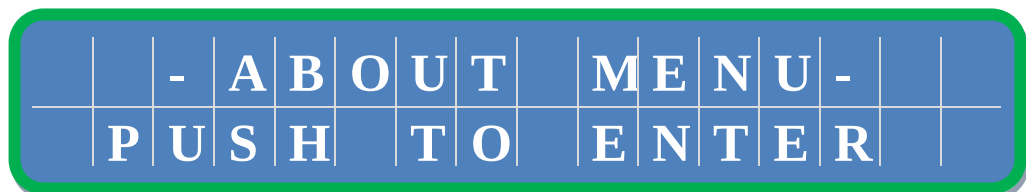


Event name	Description	Type	Notes
REF-ALARM	Reflected Power alarm	Alarm event	Threshold about 10 % of the nominal power
POWER-UP	Switching-on of the exciter	Simple event	
REFHW AL	Hardware Alarm of Reflected Power	Alarm Event	Fast protection for Reflected Power. This event type is available since the firmware release 1.43
ALARMRST	Alarm reset	Simple event	
RFT ALARM	Temperature alarm of the RF block	Alarm Event	>90°C
INPUTILK	External Interlock	Simple event	External Inhibit Command through the telemetry connector on rear panel part

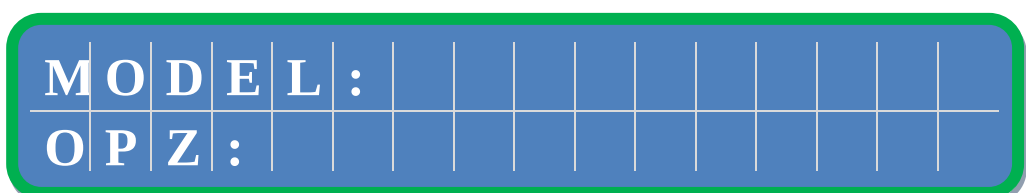
The transmitter goes in fault state and it is blocked, when the alarm events are 20. In the fault state do the alarm reset and, if the problem remains, remove the cause of the problem.

"About" Slides

Turnencoder knob to find the ABOUT MENU which contains various slides with general information on Amplifier's Model, Serial number, Manufacturer's address, Firmware version, Website and Email address



scrolling down shows MODEL and installed optional parts



Serial Number

S	E	R	I	A	L		N	U	M	B	E	R	:	

Firmware Version and date

F	I	R	M	W	A	R	E	:	2	.	2	4	D	
	0	9	-	N	O	V	-	2	0	1	2			

To exit return to main menu and push as indicated below

P	U	S	H		T	O		R	E	T	U	R	N	
	T	O		M	A	I	N		M	E	N	U		

When exit is selected the following slide indicates menu is being shut

TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

Date Hour Reading Slides

Hour an date is shown in this slide

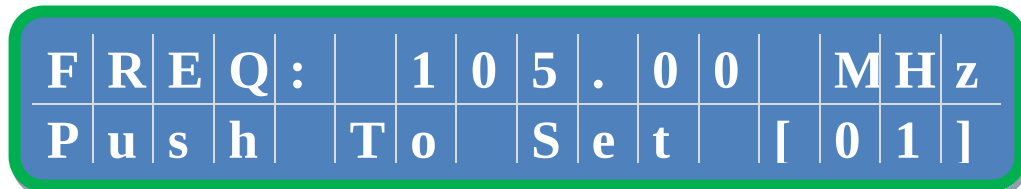
H	O	U	R	:		1	6	:	5	5	:	4	6		
D	A	T	E	:	0	9	-	1	1	-	2	0	1	2	

Section 3

PROGRAM MODE OPERATION

Frequency Setting.[01]

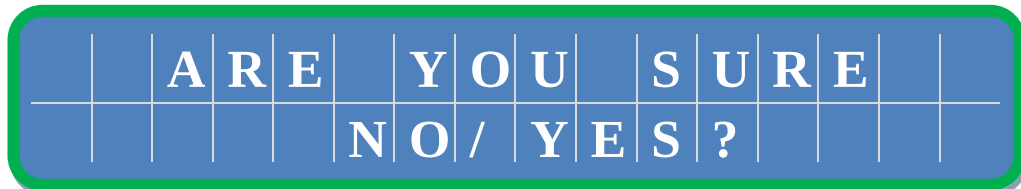
Rotate encoder knob to find slide to program frequency. Push encoder knob as indicated



Slide below shows current frequency at 105.00 MHz. Value can be modified when cursor moves under relevant characters. Turn encoder knob right or left to increase or decrease to set the wanted value



The range limits are: 87.50 MHz to 108.00 MHz. The default step is 10 kHz, but upon request, it is possible to choose different threshold values (i.e. 25 or 50 kHz). Confirm new value and exit routine by pushing the encoder knob



Cursor highlights **NO** selection by default to prevent pushing the encoder knob and enter a mistaken value

To validate your change move cursor to **YES** selection and press encoder knob, or move cursor back to **NO** selection to reject setting

Each time a **YES** selection is made the following slide appears, or if no change is made programming is exited



The microprocessor stores new data in the memory and selected value is active

RF Power Slides.[02]

To program RF Power output rotate the encoder knob to find slide below. Follow instructions to push encoder knob to enter program mode

F	W	:	2	0	0	0			R	E	F	:	0	0	0
P	u	s	h		T	o		S	e	t		[	0	2	]

The first slide on front display reads the information below

R	F		F	W	D		W	:	1	9	8	0			
F	W	:	2	0	0	0			R	E	F	:	1	.	5

Turn encoder knob right or left to increase or decrease value as required
Confirm selected value by pressing encoder knob and following slide appears

		A	R	E		Y	O	U		S	U	R	E		
						N	O	/		Y	E	S	?		

Cursor highlights **NO** selection by default to prevent pushing the encoder knob and enter a mistaken value

To validate your change move cursor to **YES** selection and press encoder knob, or move cursor back to **NO** selection to reject setting.

Each time a **YES** selection is made the following slide appears, or if no change is made programming is exited

				L	O	A	D	I	N	G					
TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

The microprocessor stores data in the memory and selected value is active

Audio Setting [03]

1) Audio Modulation

The following slide shows the stored Mod-in

A	F		C	o	n	f	i	g	:	M	o	n	o		
P	u	s	h		T	o		S	e	t	[	0	3	]	

Press the encoder knob and the following slide is shown

S	E	L	E	C	T		M	o	d	e		E	x	i	t
M	o	n			S	t	e			M	P	X	E	x	t

Select Modulation MONO, STEREO or MPX Ext;

Confirm selected mode by pushing the encoder knob.

To validate your change move cursor to **YES** selection and press encoder knob, or move cursor back to **NO** selection to reject setting

Each time a **YES** selection is made the following slide appears, or if no change is made programming is exited

				L	O	A	D	I	N	G					
TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

The microprocessor stores new data in the memory and selected value is active

The following slide to select the status (ON / OFF): SCA or RDS AUX

S	C	A	=	O	N			A	U	X	=	O	N		
R	D	S	=	O	N						>	E	X	I	T

2) Audio Input Selection

Slide is ready by the following inputs to be enabled

I	n	p	u	t		S	e	l	e	c	t	i	o	n	
	L	+	R			>	S	e	t	t	i	n	g		

I	n	p	u	t	M	o	d	e	:		L	=	O	F	F
R	=	O	F	F		L	+	R	=	O	N				

Placing the cursor in the wanted selection and change the status from ON to OFF and vice versa.

If you place the cursor "<" and press the encoder, the latter changes state and becomes ">", then you can press forward with the choice

		A	R	E		Y	O	U		S	U	R	E		
						N	O	/		Y	E	S	?		

yes or no to continue

Sensitivity [04]

The following slide shows stored Sensitivity value and consequently "on air". This slide is also the access point to set or program Sensitivity value

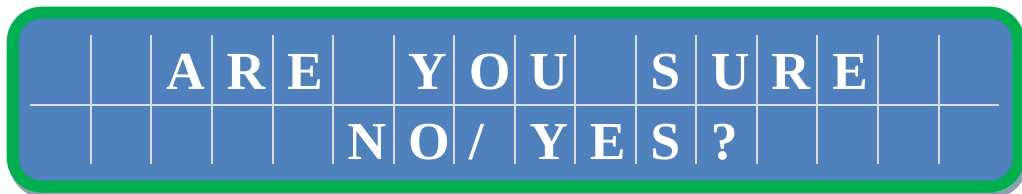
	S	E	N	S	I	T	I	V	I	T	Y		d	B	m
P	u	s	h		T	o		S	e	t		[	0	4	]

Press encoder knob and the following slide is shown

		S	E	T		s	e	n	s	i	v	i	t	y	
L	+	R	=	+	1	0	d	B							

If you rotate the encoder will see the following selections: **L + R, Left, Right, MPX, AUX1, SCA, RDS**, where each may select the sensitivity. See table AUDIO INPUTS

Exit, or close and confirm new value by pushing the encoder knob



Cursor highlights **NO** selection by default to prevent pushing the encoder knob and enter a mistaken value

To validate your change move cursor to **YES** selection and press encoder knob, or move cursor back to **NO** selection to reject setting.

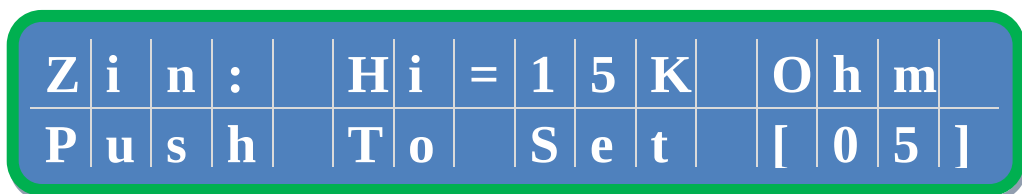
Each time a **YES** selection is made the following slide appears, or if no change is made programming is exited



The microprocessor stores the new data in the memory and selected value is active

Input Impedance [05]

Slide is ready by the following inputs to be enabled



Exit, or close and confirm new value by pushing the encoder knob

Pre-Emphasis Settings [06]

The following slide shows the stored Pre-emphasis value and consequently "on air". It is also the access point to the slide for setting the Pre-emphasis value

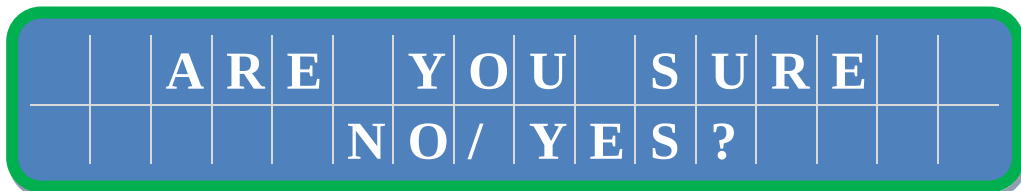


Preemphasis is set at 50 uS. Push as indicated and the following slide is shown



Turn encoder knob to increase or decrease value. Set the Pre-emphasis value to 50uS, or 75uS or Linear (Excluded pre-emphasys network).

Exit, or close and confirm new value by pushing the knob



To validate your change move cursor to **YES** selection and press encoder knob, or move cursor back to **NO** selection to reject setting

Each time a **YES** selection is made the following slide appears, or if no change is made programming is exited



The micro stores the new data in the memory and new value is active

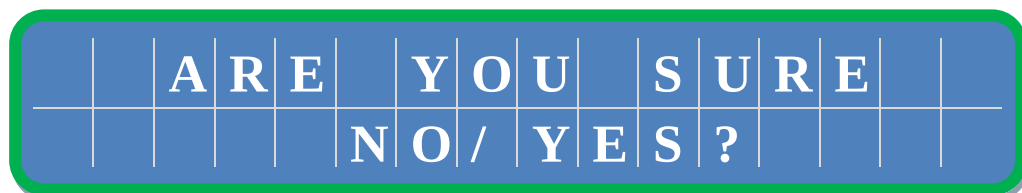
Limiter Setting [07]

The following slide shows the LIMITER status and how to switch ON or OFF as required



PUSH TO ACTIVATE

To enter new value press encoder knob, move cursor to YES selection to accept or NO to reject selection



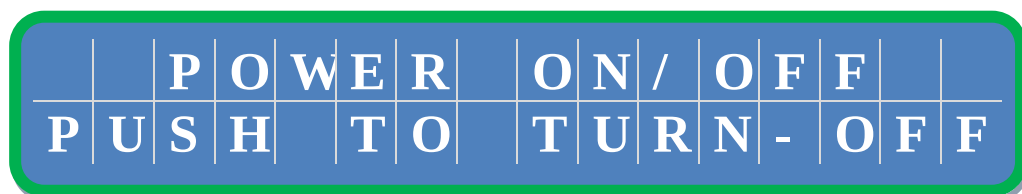
If YES is selected following slide is



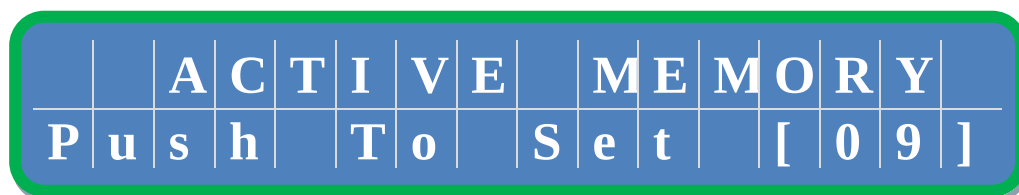
The microprocessor stores new data in the memory and new Limiter status is activated

POWER ON/OFF

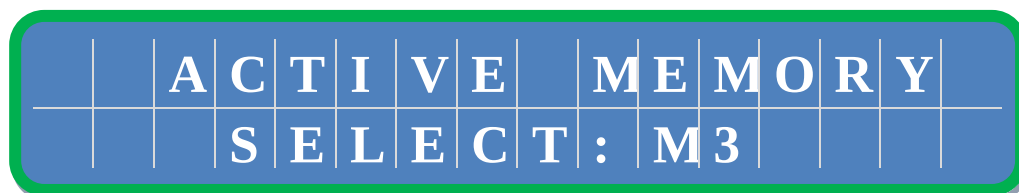
The following slide shows the LIMITER status and how to switch ON or off as required



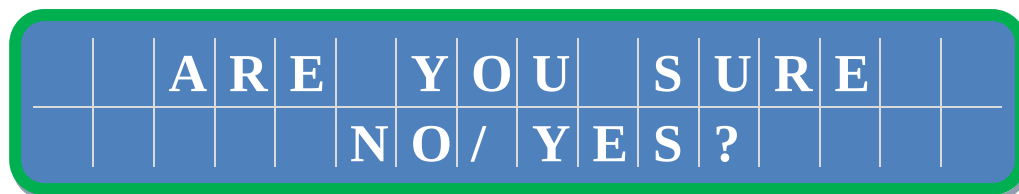
In his section you can switch-ON or OFF the RF output of the exciter (No perceptible residual RF is present on spectrum).

RECALL/ SET e Memory [9]

To activate the parameters stored in a different memory of the transmitter select the **ACTIVE MEMORY** menu as shown in the following slide



Turn the encoder knob to select a specific memory and confirm selection as usual. Move cursor to YES selection and press encoder knob



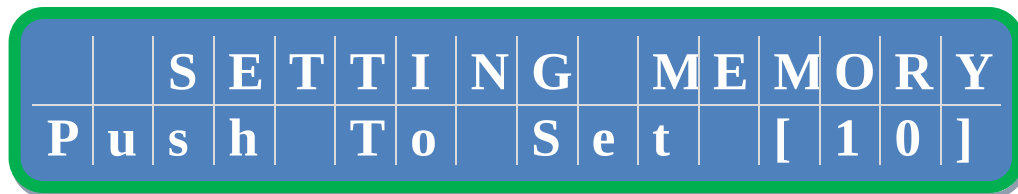
If YES selection



New data is stored

Memory Setting [10]

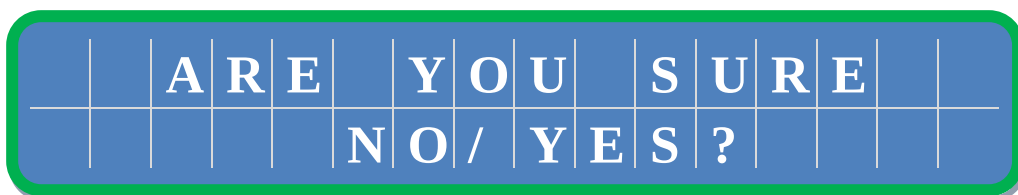
To program the different memories of Transmitter you must enter the SETTING MEMORY menu, as shown in the example below



Press encoder knob and the slide displays



Turn encoder knob to select the memory to program. Pushing the encoder knob to access the “setting state” which is indicated by the (yellow) front panel LED switching on. All selected parameters such as Frequency, Power, Audio, Address, etc can be set up and stored in the chosen memory



Slide above shows how to confirm as usual and below the micro loads new data



Note:

If you are in SETTING MEMORY only the slide for programming is displayed;
To activate a memory you must exit the SETTING MEMORY menu



This is a very important slide:
please pay attention to slide because it indicates:

1. Which memory successive data will enter (“MEMORY SET”)
2. Which memory must be set as operational for current configuration

Presetting [12]

Setting Menu refers to a some specific settings. Push the encoder knob to program the following settings

P	r	e	s	e	t	t	i	n	g						
P	u	s	h		T	o		S	e	t		[	1	2	]

1) LOCAL/REMOTE Operation

The following slide shows current mode of operation

	O	P	E	R	A	T	I	O	N	:	L	o	c	a	l
	P	U	S	H		T	O		P	R	O	G	R	A	M

Push encoder knob to program new mode of operation

			O	P	E	R	A	T	I	O	N	:			
>	L	o	c			>	R	e	m			>	S	v	c

move cursor to select Local, Remote or Svc (Service)Operation as required. Push encoder knob to program.



In every selection and subsequent appears increasingly choosing "ARE YOU SURE"

Choose with cursor and press to confirm to No or to Yes, and Loading slide appears.

				L	O	A	D	I	N	G					
TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

		A	R	E		Y	O	U		S	U	R	E		
						N	O	/	Y	E	S	?			



All remote commands via RS485 or via telemetry commands connector (DB 25) are disabled when the exciter is set in “local” mode. Otherwise they are enabled when the exciter is set in “remote” mode and all settings by menus are disabled except for this menu.

2) Normal Open\Normal Closed INTERLOCK

The following slide shows the currently stored “Interlock” status

I	N	T	L	C	K	:		N	o	r	m	O	p	e	n
P	U	S	H		T	O		P	R	O	G	R	A	M	

Push encoder knob to program new data and slide shown is

I	N	T	E	R	L	O	C	K		N	o	r	m	a	l
>	O	P	E	N			>	C	l	o	s	e	d		

Turn encoder knob to select Normal Open or Normal Closed operation for Interlock. Move cursor to YES selection and press to confirm. New data is stored as usual.



For Stand-Alone device INTERLOCK is setting on **Normal Open**

3) POWER GOOD

This value determines the minimum level for RF output power considered to be good. A value below this preset threshold causes the transmitter to fail. The slide below shows the “Power good” value currently stored

P	O	W	E	R	G	O	O	D	:		N	o	n	e	
P	U	S	H		T	O		P	R	O	G	R	A	M	

Push knob to program value and the following slide is

T	H	R	E	S	H	O	L	D	:		N	o	n	e	
P	U	S	H		T	O		P	R	O	G	R	A	M	

Turn the encoder knob to select and set value for power good. Move cursor to YES selection and press to confirm. New data is stored as usual

4) AUDIO GOOD

The following slide shows the “Audio good” value currently stored

A	U	D	I	O	G	O	O	D	:		N	o	n	e
P	U	S	H		T	O		P	R	O	G	R	A	M

Push encoder knob to program required value and the slide appearing is the following

S	I	L	E	N	C	E	:		N	o	n	e		
P	U	S	H		T	O		P	R	O	G	R	A	M

Turn encoder knob to select desired value of audio good. Move cursor to YES selection and press to confirm. New data is stored as usual

5) SET ADDRESS

The following slide shows the address assigned to equipment; address (00) is default address assigned by manufacturer. This function allows equipment to be identified and addressed when included in a Network because each Transmitter is identified by address assigned

	S	E	T		A	D	D	R	E	S	S	:	3	1
P	U	S	H		T	O		P	R	O	G	R	A	M

Push encoder knob to program a different address

		A	D	D	R	E	S	S	:	3	1			
	P	U	S	H		T	O		S	A	V	E		

Turn the encoder knob and a specific 2-digit address can be set and saved in memory. The usual confirmation and storing procedure. The correct address for stand-alone use is “00”. When the TCP/IP optional telemetry interface is mounted, the right address is “31”.

6) CODE Source

C	o	d	e	:	-	-	-	-	-	-	-	O	F	F
P	U	S	H		T	O		P	R	O	G	R	A	M

(	-	-	-	-	-	-	)	O	F	F				
S	A	V	E								E	X	I	T

Type in the CODE. Then move the cursor to select and press to confirm

7) 19 KHz Source

The following slide shows 19KHz Source:

1	9	K	H	z	S	o	u	r	c	e	:	I	N	T
P	U	S	H		T	O		P	R	O	G	R	A	M

	1	9	K	H	z	S	o	u	r	c	e			
-	>	I	N	T							E	X	T	<

Move the cursor to select and press to confirm. New data is stored

8) AGC Source (MUST BE SET "INT")

A	G	C		S	o	u	r	c	e	:	I	N	T	
P	U	S	H		T	O		P	R	O	G	R	A	M

		A	G	C		S	o	u	r	c	e			
-	>	I	N	T							E	X	T	<

9) INT RDS (Optional)

I	N	T		R	D	S	:	A	C	T	I	V	E	
P	U	S	H		T	O		P	R	O	G	R	A	M

		R	D	S		C	A	R	R	I	E	R		
-	>	O	N								O	F	F	< -

Enable/disable the optional RDS internal encoder when is present.

10) DATE TIME

D	a	t	e	/	T	i	m	e						
P	U	S	H		T	O		P	R	O	G	R	A	M

D	:	1	3		M	:	0	9		Y	:	2	0	1	0
H	O	U	R	:	1	0		M	I	N	:	5	1		>

to Move the cursor ">" push encoder knob to program New data is stored

11) ALARM RESET

		A	L	A	R	M		R	E	S	E	T		



In this section you can reset the alarms that contribute to lock the device

11) ALARM RESET

When an alarm reset is made, the alarm events remain in the menu "LAST 20 EVENTS"

Digital AES/EBU (option)

The following slide shows



press encoder knob to select between the analog or optional digital (AES/EBU) audio input

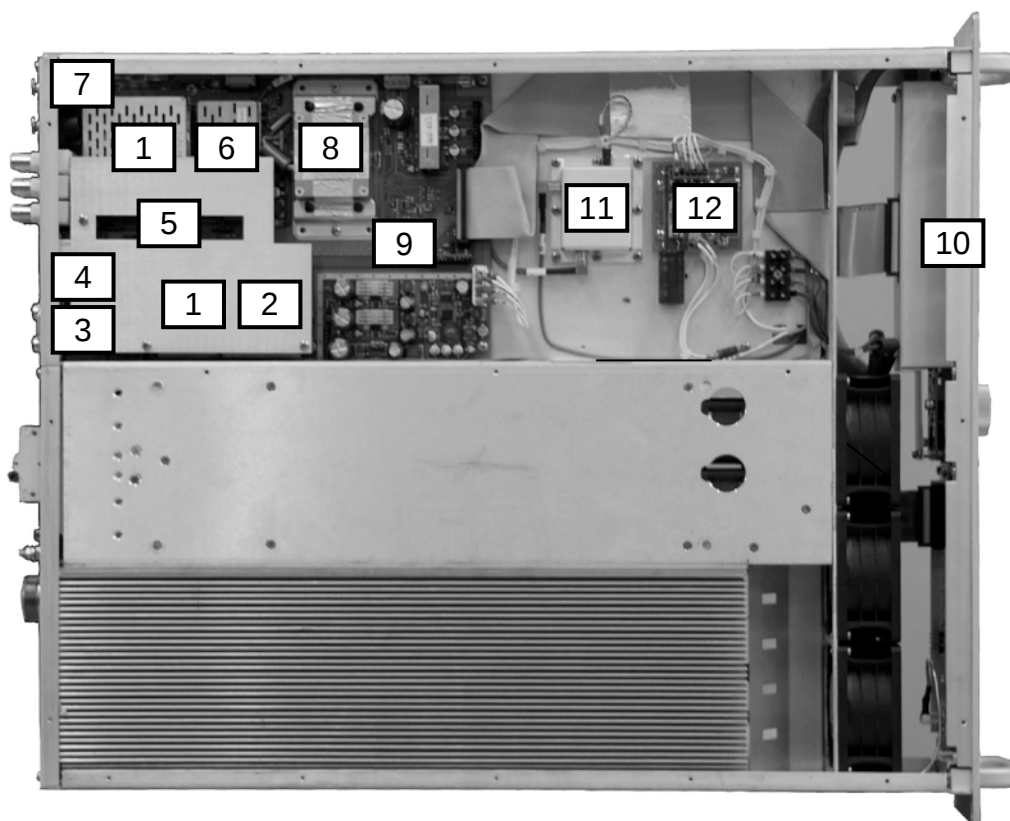


Section 4

Transmitter subsystems

The Exciter is built using the following parts which are replaceable units:

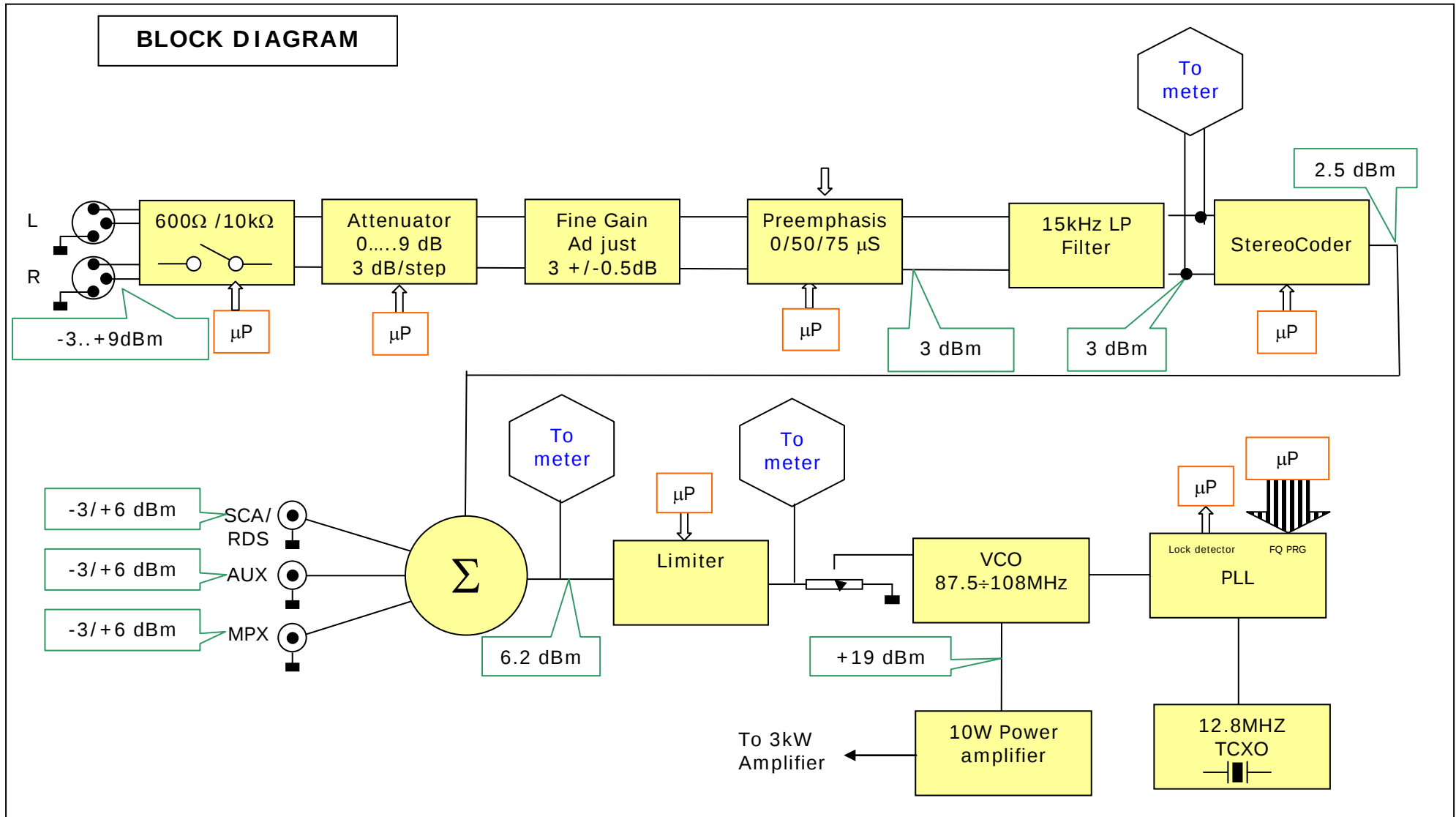
EXCITER SUBSYSTEMS



Internal layout - bottom view

Spare parts

Nr. item	Description	Code Spare part
1	Audio Filter Module	STF01702
2	Stereo coder Module	STF01703
3	Rear I/O Board	SDI02800
4	X-Port Lan Interface	SDI02801
5	RDS Module (Optional)	SDZ00110
6	PLL Module	STF01705
7	AES/EBU Digital Audio Interface (Optional)	SDI00710
8	VCO Module	SDV00310
9	Main Board	SDM01010
10	Logic & display Board	SDI03610
11	PREDRIVER VHF 10W	7543317010
12	DC DISTRIBUTION FT FUSE	910700013A



4. 2 kW RF Amplifier Section

TABLE OF CONTENTS

- General description
- Internal Layout
- Block Diagram Functional Description
- Front Panel Display
- Rear Panel View

Associated Documents

Code	Description	SI	SE	TP	PL
910000029C	25W RF DRIVER		X	X	X
910200046A	2 WAY FM SPLITTER		X	X	X
910000042A	1.1kW FM PALLET		X	X	X
910200047A	2 WAY FM COUPLER + L.P. FILTER		X	X	X
910700016A	DC DISTRIBUTION FT FUSE		X	X	X
910500031A	AMP.CONTROL BOARD		X	X	X
910500048A	EXCITER INTERFACE		X	X	X
910500046A	DISPLAY INTERFACE		X	X	X
910500050A	DISPLAY BOARD		X	X	X
910500049A	CONTROL BOARD INTERFACE		X	X	X

Legend

SI	Interconnection Diagram
SE	Electrical Diagram
TP	Topographic Layout
LP	Part List

General description

The **2kW RF Amplifier Section**, is designed for the VHF band II FM power amplification process, this unit employs latest generation solid state LD-MOS gold-plated transistor technology in order to obtain reliability and high efficiency. It operates as a wideband amplifier over the full frequency band.

The LD-MOS transistors utilised operate in B class, each RF block amplifier is easy replaceable without any soldering and alignment, it comprises circuits for stabilising the operating point and monitoring (temperature, current etc.).

The cooling system is performed with forced air by means of the high performance DC fans with electronically commutated external rotor motor, the commutation electronics fully integrated inside the fan's body. The suitable mechanical structure, fully integrate, provides to convey the fluid toward the RF module heat-sink and power supply section.

The Fig.1 shows the simplified block diagram. The input power is applied via two way splitter to the output final RF stages than combined by the RF output coupler and low-pass filter for the harmonics suppression, the circuit involves also the directional couplers for RF monitoring, measurement and SWR protection

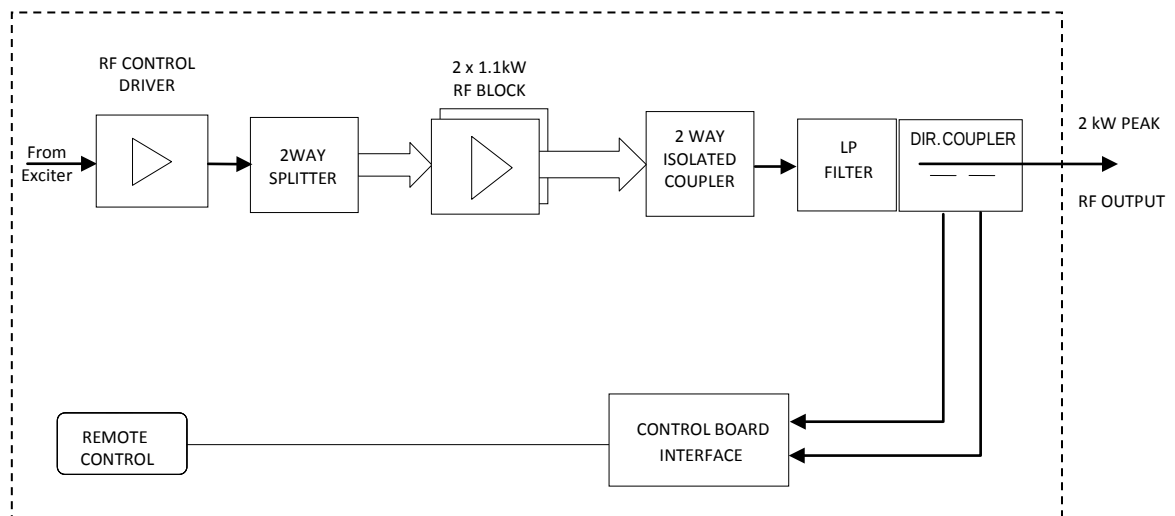
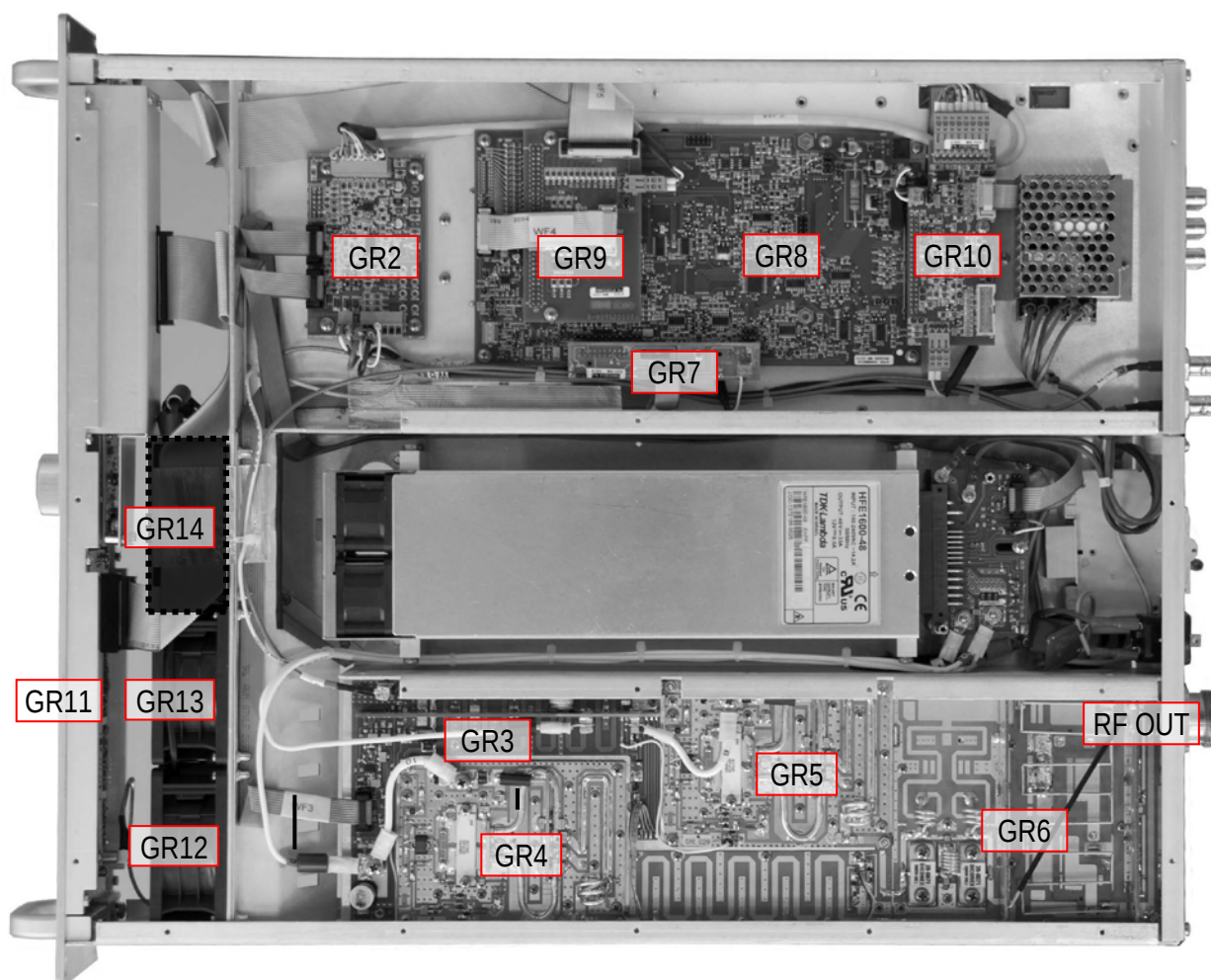
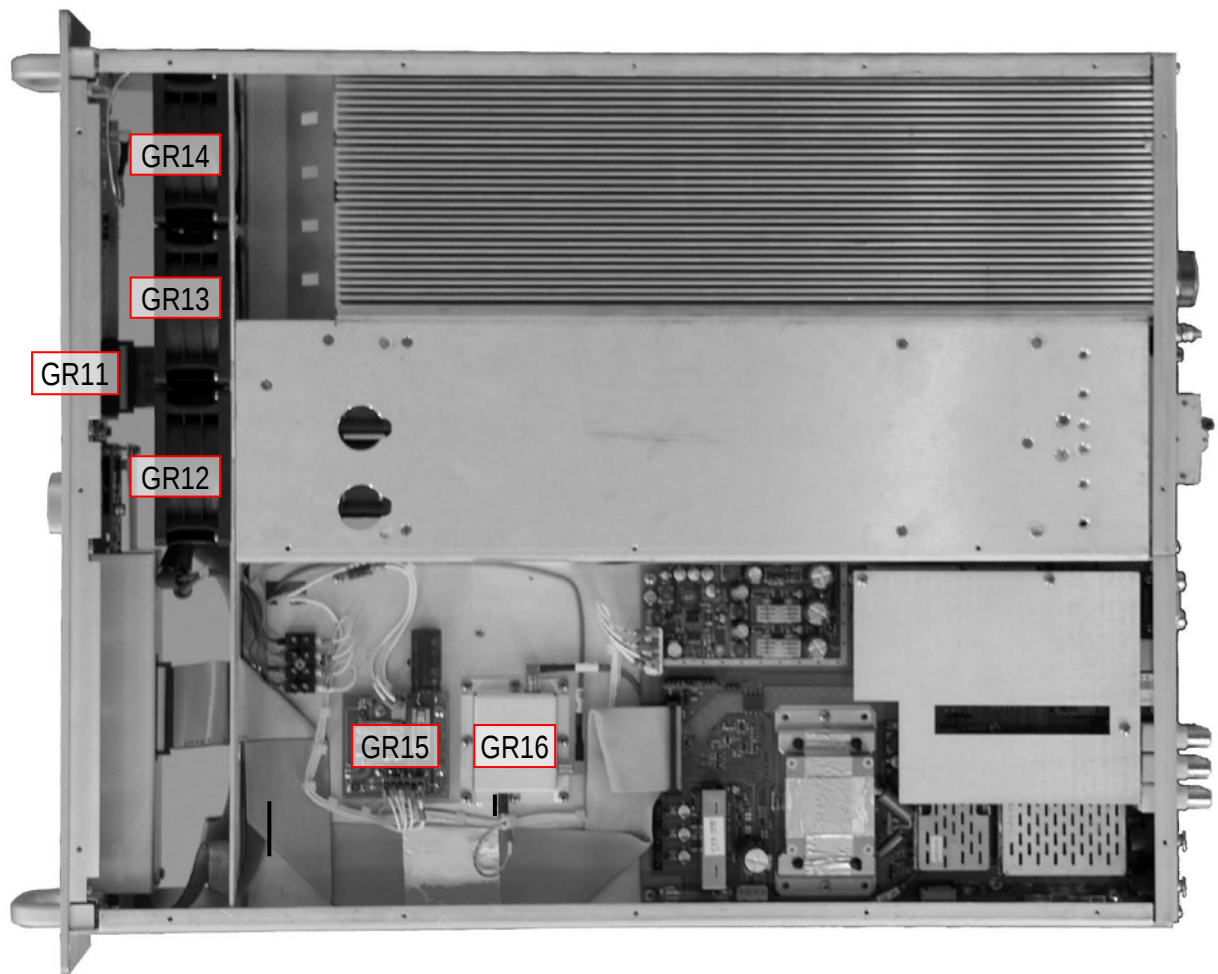


Fig. 1 RF 2 kW Amplifier Section – simplified block diagram

Internal layout - Fig. 2



Code	Description	Reference
910500047A	PWR SUPPLY INTERFACE 2	GR2
910200046A	2 WAY FM SPLITTER	GR3
910000042A	1.1kW FM PALLET	GR4 ; GR5
910200047A	2 WAY FM COUPLER + LPF	GR6
910500049A	CONTROL BOARD INTERFACE	GR7
910500031A	AMP.CONTROL BOARD	GR8
910500046A	DISPLAY INTERFACE	GR9
910500048A	EXCITER INTERFACE	GR10
910500050B	DISPLAY BOARD	GR11
	BLOWER	GR11..GR13



Code	Description	Reference
910500050B	DISPLAY BOARD	GR11
	BLOWER	GR11..GR13
910700013A	DC DISTRIBUTION FT FUSE	GR15
910000029C	25W RF CONTROL	GR16

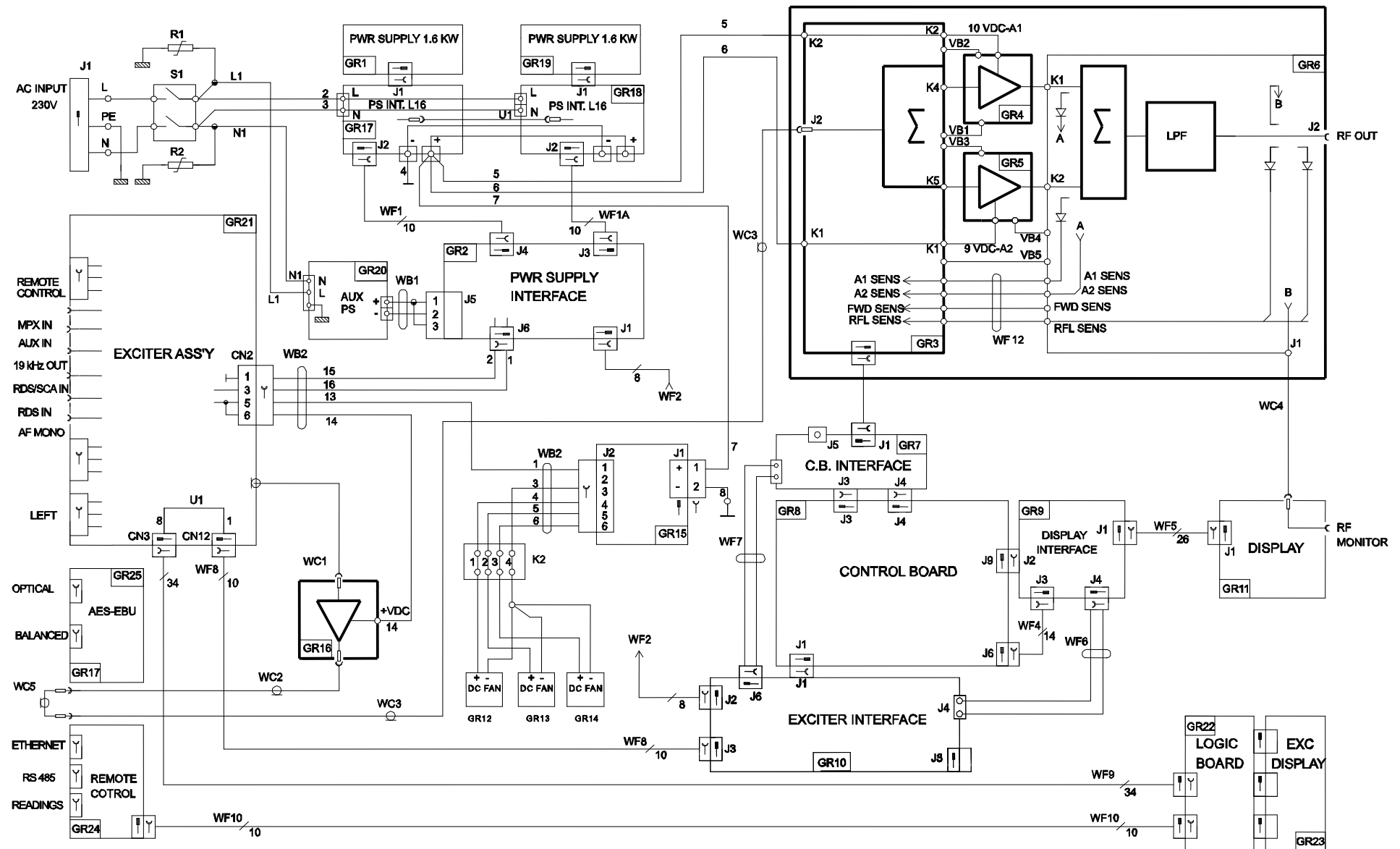


Fig. 1 2kW RF Amplifier Section - block diagram

- **Block diagram description**

RF Control Driver (driver stage)

The RF signal coming from the exciter is applied to the input circuit , this one provides to the following signal processes before amplification:

- First amplification
- RF input monitoring
- Power input detection
- Overdrive protection
- Power gain adjustment
- RF switch-off

Driver stage includes only one device capable of 50 W RF output ; in order to obtain reliability and high performances, the normal power rating is reduced up to 25 W.

Two Way splitter

The circuit provides to distribute the RF to the final stage , the signal is divided in two way and then applied to the two RF Block.

RF block (Pallet final stages)

The board is the RF amplifier basic block including LD-MOS devices, bias circuit a amplifier consists in a "push-pull" stage coupled by means of the combining system fully integrated in the RF block.

Two Way coupler and Low Pass Filter

The unit provides to combine two RF signals coming from the final stages, it includes also the absorber resistor in order to keep a good matching and high isolation in case of the partial final stage failure.

The RF power output path includes the low-pass filter for the harmonics suppression, it is realised with silver plated inductors and microstrip capacitors to be resistant to the RF high voltage.

The group includes two directional coupler for RF power output and reflected RF power monitoring. and SWR protection circuit .

Control Board Interface

The board collects the parameter signals coming from the sensor installed in the RF module and after the process it provides to enable the RF and power supply circuits , furthermore the status is represented on the DISPLAY BOARD accessible from the front panel.

The fig. 5 shows the signals flow block diagram.

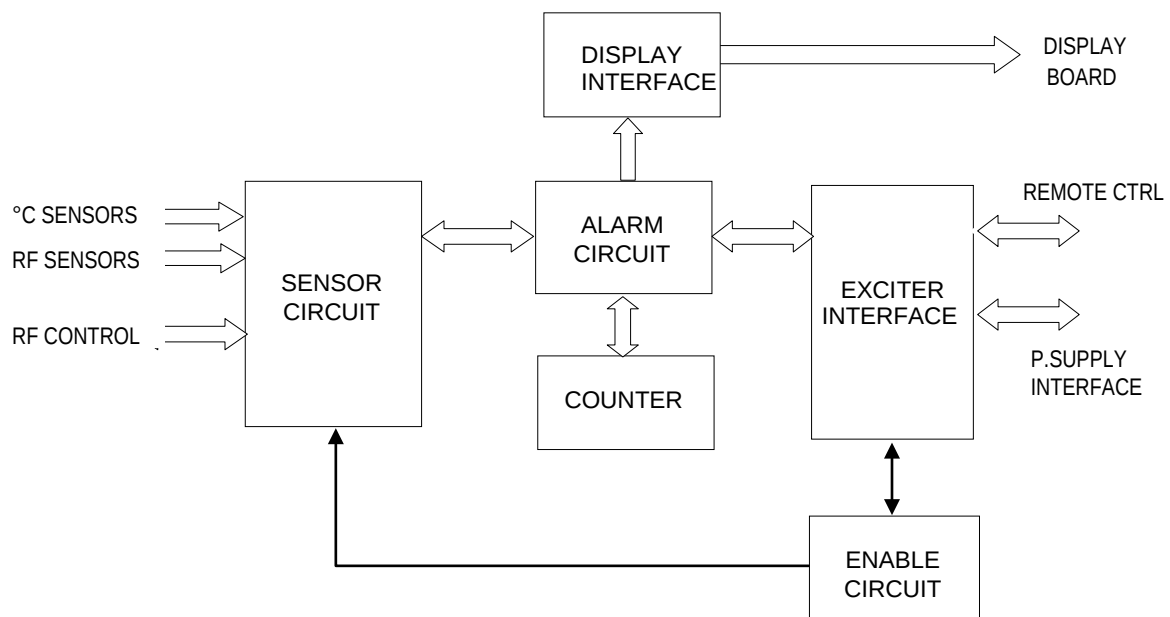


Fig. 5

The sensor signals coming from temperature detectors, RF differential detectors and RF control circuit are sent to the **sensor circuit** that provides to digital signal conversion.

The **alarms circuit** receives the information's from the sensor circuits and remote enable control , then the logic signals processed are sent to the display board and remote interface.

The **counter** provides to generate the BLOCK signal after a programmed number of the alarms occurred .

The **display driver** provides to collect the input and output signals present to the front panel display board, as LED's indication and commands.

The **exciter interface** circuit provides to collect all signals in digital form and by means bus sends to the computerised Control Unit.

The **enable circuit** drives the RF CONTROL and AC/DC POWER SUPPLY in base of the instruction presents and alarm circuit.

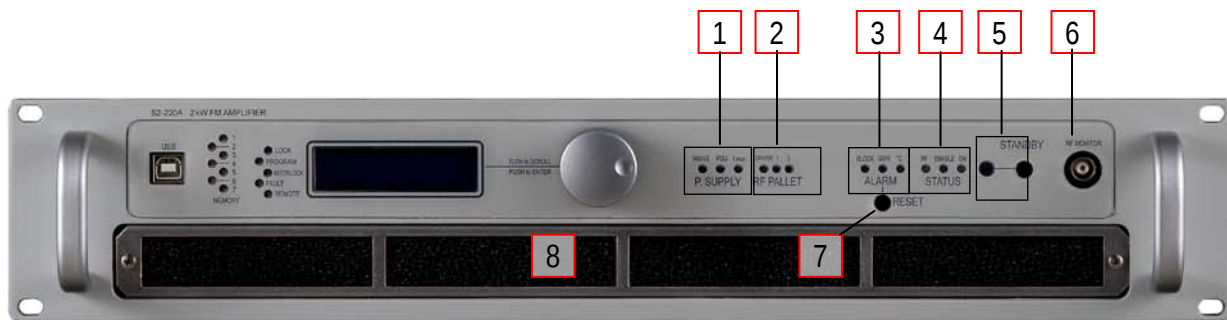
Display Board

The board mounts the LED and pushbutton for display monitoring , ALARM RESET, and STANDBY COMMAND (some version) on front panel , the driving signals are coming from CONTROL BOARD INTERFACE via cable.

Temperature sensor

The circuit includes two thermistors mounted along the heat-sink for the temperature monitoring, the signal are sent to the CONTROL BOARD INTERFACE.

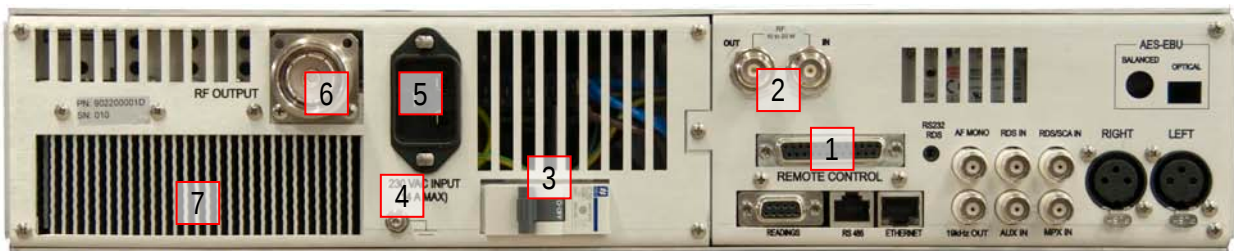
Front Panel Display - Fig. 6



Nr	Label	Description
1	P.SUPPLY	MAINS red LED which indicates a failure of VAC mains voltage input , as out-range values or missing phase
		PSU red LED which indicates a failure occurred to the AC-DC power supply module
		I max red LED which indicates a current overload present to the power supply unit.
2	RF PALLET	DRIVER red LED which indicates a failure to the RF driver module named PA0
		1 2 red LED's which indicate a failure to the relevant RF basic modules (Pallet) named as: "1" referred to PA1 "2" referred to PA2
3	ALARM	BLOCK red LED which indicates a block of the machine due to five tentative of alarms restoring failed. The alarms called for are: • SWR Standing Wave Ratio (output mismatch $\geq 1:2$) • °C Heat sink Temperature (≥ 70 degree)
		SWR red LED which indicates presence alarm
		°C red LED which indicates presence alarm

4	STATUS	RF green LED which indicates the RF ON AIR , when RF level reach $\geq 30\%$ of the nominal max value,
		ENABLE green LED which indicates the apparatus activated and ready to working normally
		ON green LED which indicates the machine TURN-ON and AC Mains Voltage present
5	STANDBY	Push-button provided to disable the RF Output
		Yellow LED which indicates STANDBY status
6	RF MONITOR	RF MONITOR 50 Ω BNC female connector for monitoring of RF output signal present . Level 10 dBm $\pm$ 3 dB referred to max nominal RF
7	RESET	RESET push-button provided to reset all memorized alarms occurred after restoring procedure failed
8	-----	AIR INLET GRID provided of removable air dust filter

Rear Panel view - Fig. 7



Nr	Label	Decription
1	REMOTE CONTROL	Details described on <i>Chapter 2 / Remote Operation</i>
2	RF IN – OUT 10W	BNC Loop for link through Amplifier RF IN - Exciter RF OUT. Level required 2 to 4 W
3	AC MAINS POWER	AC connector , provided with security cable holder.
4		M4 Terminal Ground
5	MAIN BREAKER	Circuit-breaker , with delayed, thermal trip release for overcurrent protection.
6	RF OUTPUT	EIA 7/16" connector
7	-----	Exhaust air outlet

4. 3kW AC/DC Power Supply Unit

TABLE OF CONTENTS

- General description
- Electrical Features
- Block Diagram
- Functional Description
- Internal Layout
- Electrical Plant Recommendations

Associated Documents

Code	Description	SI	SE	TP	PL
920500047B	POWER SUPPLY INTERFACE		X	X	X
910700016A	POWER SUPPLY INTERFACE L1.6		X	X	X
0906300007	AC/DC IN 85-264V - OUT 48V 33A /12V-0.5A	Data sheet			
0906300008	AC/DC IN 85-264V - OUT 15V 1A	Data sheet			

Legend

SI	Interconnection Diagram
SE	Electrical Diagram
TP	Electrical Layout
PL	Part List

General Description

The power supply unit is installed aside from RF section and is realized by independent AC/DC modules easy accessible .

The AC/DC module has an individual protection against over-current, over-voltage and temperature , so that any failure occurred cause only a reduction of RF power , without service interruption.

The high tolerance mains voltage ($\pm 20\%$) is accepted, so that in most situations, the Automatic Voltage Regulator is not necessary.

Each AC/DC power supply provides 48 VDC up to 1600W for the RF power amplifier, an auxiliary 15 VDC AC/DC is utilized for services circuit .

The unit is designed to satisfy the following requirements

- Active Power Factor Correction
- Active AC Inrush limit Control
- High Efficiency up to 90%

Electrical features (Single Module)

- | | |
|--------------------------------------|---|
| • Input : | Vin = 230Vac, $\pm 20\%$
(48 ÷ 62 Hz)
Imax = 16A@230Vac |
| • Output MAIN: | 32÷48 Vdc $\pm 1\%$
Imax = 60A |
| • Output AUX: | 15Vdc $\pm 1\%$
Imax = 1A |
| • Operating temperature: | –10 ÷ +45°C, non derating |
| • Storage temperature: | – 20°C ÷ +65°C |
| • Max relative humidity: | 95% RH |
| • Efficiency @ 100% load: | 90 % (worst case) |
| • Power factor: | > 0.98 |
| • Hold-up time (load 100%) : | 20 msec |
| • Peak Inrush current: | <15A @230 Vac |
| • Switching frequency: | 30 ÷ 70 KHz |
| • Ripple V MAIN | <0.5Vpp |
| • Ripple V AUX | <0.1Vpp |
| • Insulation voltage (input/output): | 1,5KV@50 Hz, 60sec |
| • Insulation voltage (input/GND): | 1,5KV@50 Hz, 60sec |
| • Insulation voltage (output/GND): | 0V (Out– to GND) |
| • MTBF: | >800.000 h (T. amb. +25°C) |

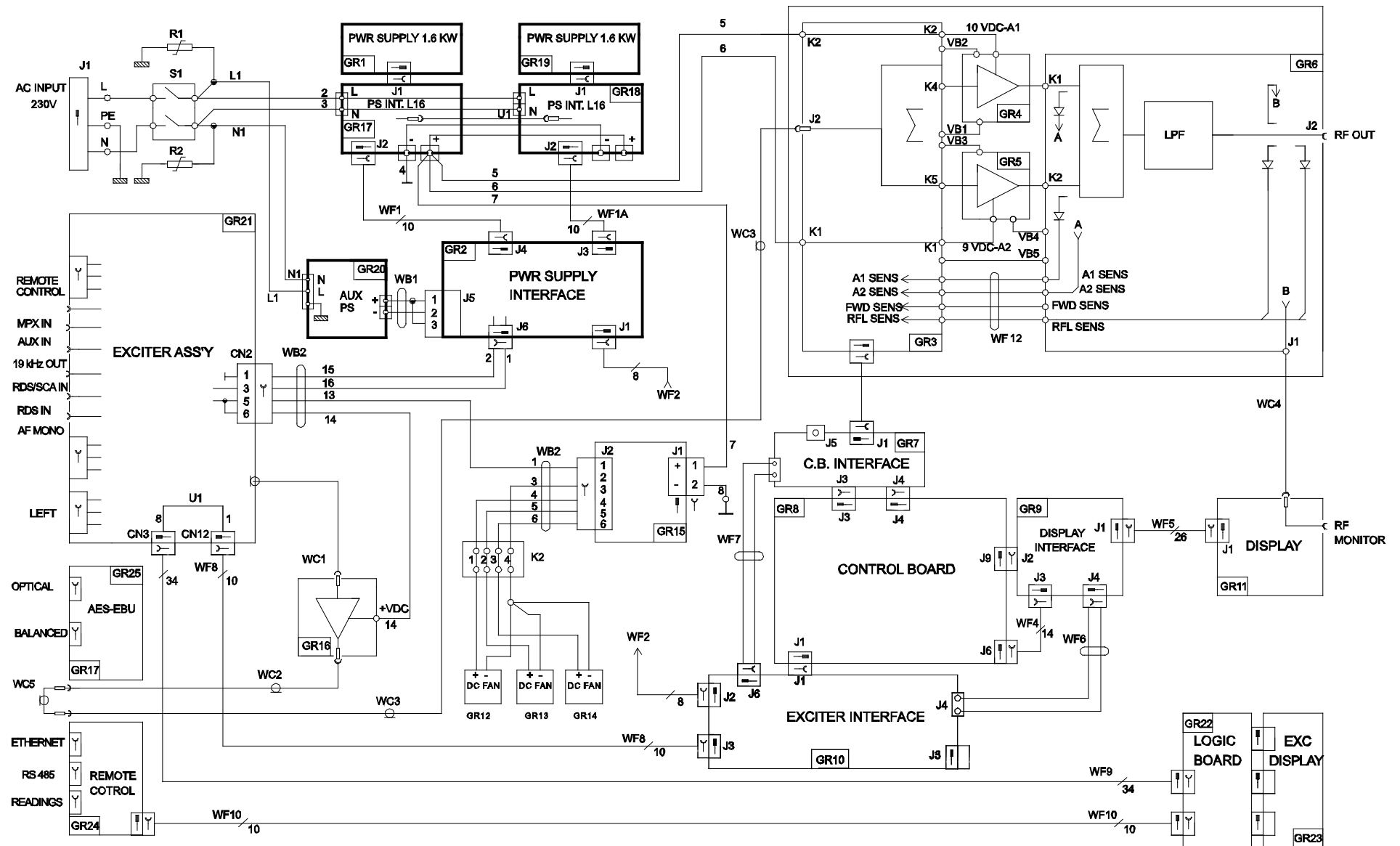


Fig. 1 AC/DC Power Supply Unit - block diagram

- **Functional Description (see Fig. 1)**

The AC Mains Power applied to J1 connector feeds the GR20 auxiliary power supply and , through the GR17 and GR18 interfaces, the two power supplies (GR1 and GR19) , by means mains breaker S1 which turn the amplifier ON/OFF and it is supplied with a thermal trip release for overcurrent protection.

The overvoltage protection is realized with discharger arresters that provide a voltage cut-off at 275V between AC wires and AC wires to ground.

WARNING 208 - 240 VOLTAGE

The AC Power must be applied by suitable cables

The two AC/DC Switching Power Supplies powered by the Mains Power Voltage through pertinent connector generates a DC voltages of 48V 3.2 kW and the auxiliary Power supply a 15VDC 1A.

The GR2 “Power Supply Interface” board provides to following functions:

- Power Supplies Output Voltage Control
- Power Supplies Inhibit Control
- Voltage Monitor
- Current Monitor
- Overload and Overtemperature Alarm

The controls are allowed by means of J3/J4 connector linked with WF1/WF1A cables through Power Supply module GR1/GR19. Table 2 shows the pin-out signal.

The auxiliary +15VDC, coming from the Power Supply is sent through WB1 cable to the connector J5 of the GR2. The auxiliary +15VDC output is then present to J6 for Exciter FM modulator (when present in some version) and auxiliary circuits. The pin-out is shown in Table 3

The GR2 allows the complete management of the AC/DC Power Supply by means J1 connector linked via WF2 to GR10 “Exciter Interface” board. The Control Signal and pin-out of J1 is shown in Table 1.

Table 1

J1 pin-out	Signal direction	Description	Note
1	Input	VDC Control	-0.7 to 3.2V full scale
2	Gnd	-----	-----
3	Output	VDC Measure	3V full scale (+48V)
4	Gnd	-----	-----
5	Output	+ 15V; 2A max	To services circuit
6	Input	Power Supply Enable	Close to Gnd (Active)
7	Output	Power Supply Alarm	Close to Gnd (Active)
8	Output	IDC Measure	3V full scale (200A)

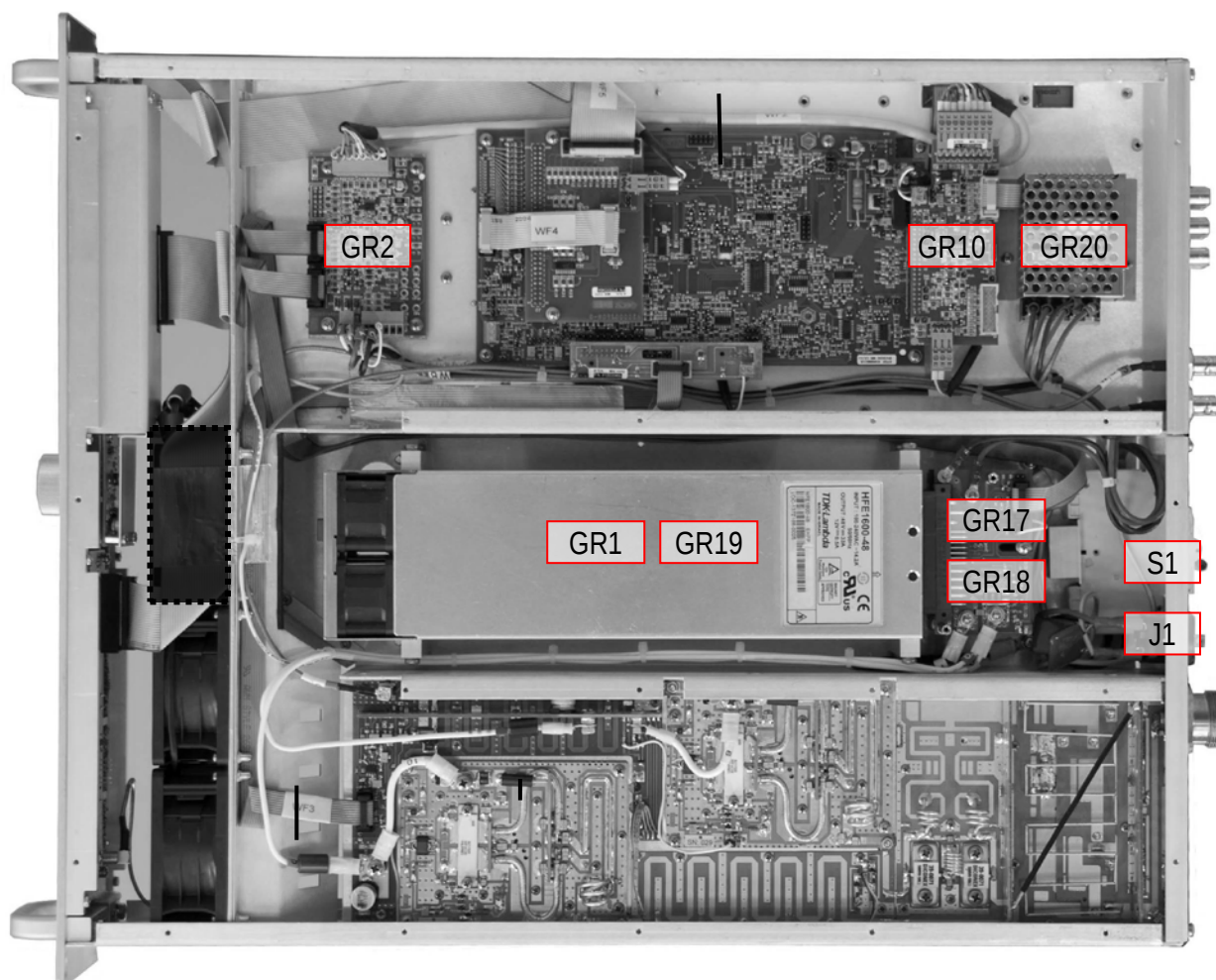
Table 2

J2-J3-J4 pin-out	Signal direction	Description	Note
1-2-3	Gnd	-----	
4	Output	Inhibit	Open to Gnd (Active)
5-10	Input	Voltage Monitor	$V = V_{out}/10$
6	Input	Current Monitor	$V = IDC (A) /5$
7	Input	Overtemperature	Close to Gnd (Active)
8	Output	Voltage Control	-0.7 to 3.2V full scale
9	Input	Overvoltage	Close to Gnd (Active)

Table 3

J5 pin-out	Signal direction	Description	Note
1	Input	+ 15V; 2A max	From GR3
2	Input	Common	From GR3
3	Input	+ 15V; 2A max	From GR4
4	Input	Common	From GR4
5	Input	+ 15V; 2A max	From GR5
6	Input	Common	From GR5

Internal layout - Fig. 2



Code	Description	Reference
0906300007	AC/DC PWR SUPPLY 48V-1.6KW	GR1/GR19
910500047A	PWR SUPPLY INTERFACE	GR 2
910500048A	EXCITER INTERFACE	GR 10
0421300030	AUTOMATIC BREAKER	S1
0500000002	AC POWER CONNECTOR	J1
	TERMINAL BLOCK	K1
910500056A	POWER SUPPLY INTERFACE	GR17/GR18
0906300008	AC/DC PWR SUPPLY 15V-1A	GR20

TDK-Lambda

Innovating Reliable Power


- 25.2W/in³ power density
- Internal ORing MOSFET & Current Share
- Climate Savers Computing efficiency standards
- Up to 8000W in 1U rack
- Status monitoring signals
- PMBus option



HFE1600 Series

1600W 1U Hot Swap Front End
Power Supplies

Key Market Segments & Applications

Power for Distributed Power Architecture
Industrial Automation

HFE1600 Features and Benefits

Features	Benefits
• 1U high • Internal ORing MOSFET & Current Share • Status monitoring signals	• Utilizes less system space • Suitable for N+1 redundancy • Easier system monitoring including PMBus

Specifications

ITEMS		MODELS	
Input Voltage Range	(2)	VAC	85 - 265VAC, 47 - 63Hz. See model selector for power derating
Input Current (Max) 100/230VAC		A	12.4 / 8.1A
Inrush Current		A	<35A
Power Factor Correction	-	-	Meets EN61000-3-2, PF > 0.98 at full load
Temperature Coefficient		%/°C	<0.02%/°C
Overcurrent Protection		%	105 - 120%. Programmable by external voltage (0-5V)
Overvoltage Protection	(1)	%	110% (Tracking). Cycle AC to reset or utilize Remote On/Off
Overtemperature Protection	(1)	-	Shutdown with automatic restart. Warning signal provided
Hold up time		ms	>10ms, 100/230VAC input, 80% loading
Leakage Current		mA	< 0.75 / 1.5mA 100/230VAC, 60Hz
Remote Sense Compensation	-	-	HFE1600-12: 0.25V/wire, HFE1600-24: 0.5V/wire, HFE1600-32: 0.75V/wire, HFE1600-48: 1V/wire
Indicators	-	-	AC OK: Green LED, DC OK / Fail: Green / Red LED
Remote On/Off	-	-	Unit ON: 0 - 0.6V or short, OFF: 2 - 15V or open circuit
Parallel Operation	-	-	Yes, single wire current share, 90% accuracy, up to 10 units
AC Fail Signal	-	-	Open Collector, ON when AC is within 85 - 270VAC
DC Good Signal	-	-	Open Collector, ON when output is above 85 to 95% of setpoint (tracking)
Remote Adjust	(1)	-	By either external 0 - 5V signal or 1k potentiometer
PC Interface	(1)	-	Isolated from output, Add suffix /S, PMBus compatible
Auxiliary Output	-	-	11.2 - 12.5V, 0.5A, 240mV ripple and noise
Operating Temp. (-TB Rack)		°C	-10°C to +70°C, derate 2%/°C from 50°C to 60°C, 2.5%/°C from 60°C to 70°C
Operating Temp. (-IEC320 Rack)		°C	-10°C to +60°C, derate 2%/°C from 50°C to 60°C
Storage Temperature		°C	-30°C to +85°C
Humidity (Non condensing)		%RH	Operating: 10 - 90%RH, Storage: 10 - 95%RH
Cooling	-	-	Two variable speed internal fans, airflow exits across input/output connector
Withstand Voltage	-	-	IP to O/P 3kVAC, IP to Ground 2kVAC, O/P to Ground: HFE1600-12, -24V 500VAC, HFE1600-48 1.5kVAC
Isolation Resistance		Ω	>100MΩ at 25°C & 70%RH, Output to Ground 500VDC
Vibration (Basic transportation)	-	-	Meets IEC61068-2-64
Shock (Basic transportation)	-	-	Meets IEC61068-2-27
Safety Agency Certifications	-	-	UL60950-1, EN60950-1, CE Mark
Conducted and Radiated EMI	-	-	EN55022 & FCC part 15; Conducted class B, Radiated class A
Immunity	-	-	IEC61000-4-2 (lv 2,3), -3 (lv 2), -4 (lv 2), -5 (lv 3,4), -6 (lv 2), -8 (lv 4), -11
Size (W x H x D)		mm	Power Supply: 85 x 41 x 300, Rack: 445 x 44 x 365
Weight		g	Power Supply: 1550g, Rack: 4800g
Warranty		yrs	3

(1) See installation manual for detailed specifications & test methods

(2) Derate output power linearly 1%/V from 100VAC to 85VAC input

HFE1600 Series

1



15W Single Output Switching Power Supply

RS-15 series



■ Features :

- Universal AC input / Full range
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- LED indicator for power on
- 100% full load burn-in test
- No load power consumption<0.5W
- All using 105°C long life electrolytic capacitors
- Withstand 300VAC surge input for 5 second
- High operating temperature up to 70°C
- Withstand 5G vibration test
- High efficiency, long life and high reliability
- 3 years warranty



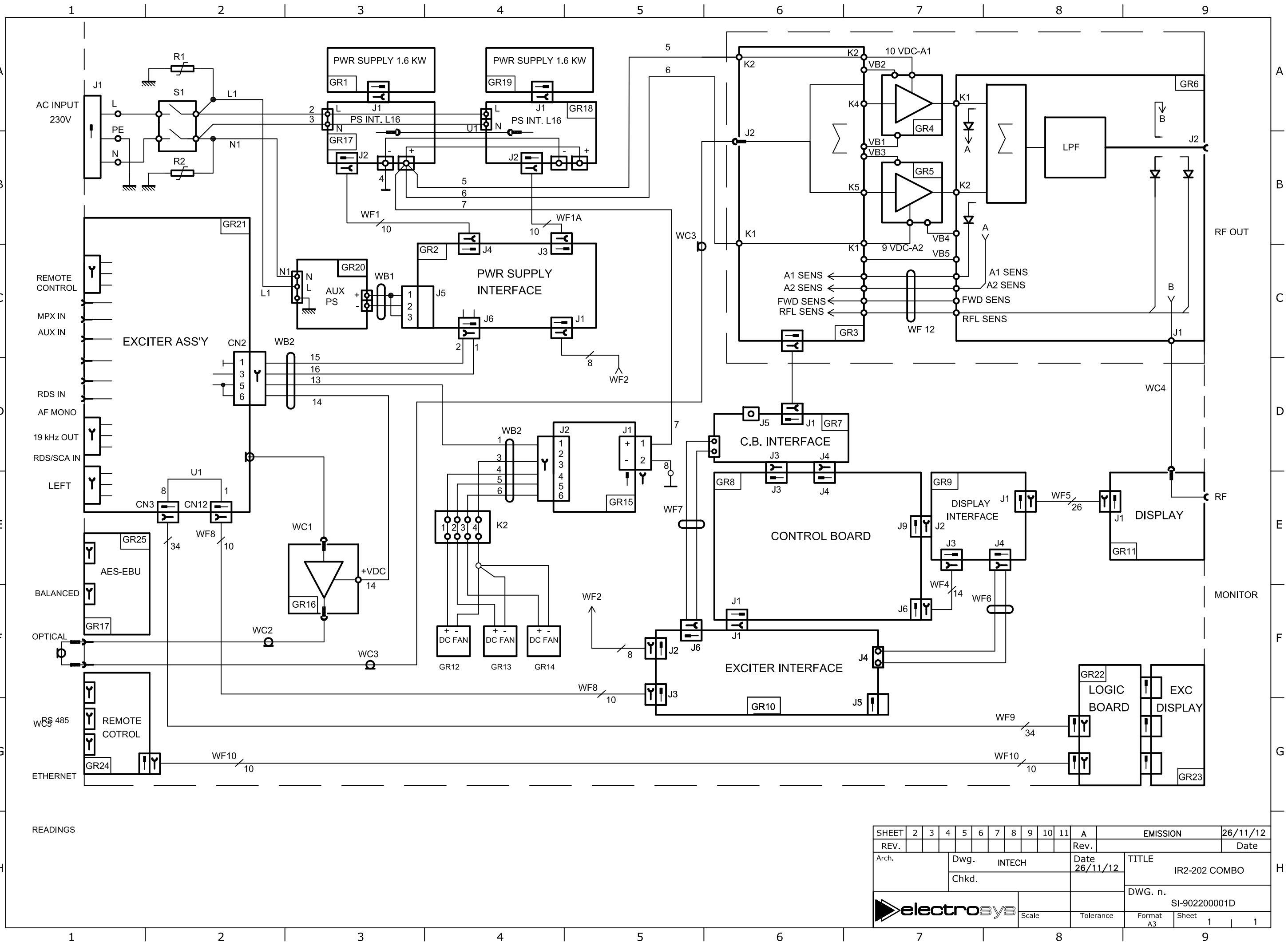
SPECIFICATION

MODEL		RS-15-3.3	RS-15-5	RS-15-12	RS-15-15	RS-15-24	RS-15-48
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V
	RATED CURRENT	3A	3A	1.3A	1A	0.625A	0.313A
	CURRENT RANGE	0 ~ 3A	0 ~ 3A	0 ~ 1.3A	0 ~ 1A	0 ~ 0.625A	0 ~ 0.313A
	RATED POWER	9.9W	15W	15.6W	15W	15W	15.024W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	120mVp-p	120mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	2.9 ~ 3.6V	4.75 ~ 5.5V	10.8 ~ 13.2V	13.5 ~ 16.5V	22 ~ 27.6V	43.2 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	± 3.0%	± 2.0%	± 1.0%	± 1.0%	± 1.0%	± 1.0%
	LINE REGULATION Note.4	± 0.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%
	LOAD REGULATION Note.5	± 2.0%	± 1.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%
	SETUP, RISE TIME	1000ms, 30ms/230VAC 1000ms, 30ms/115VAC at full load					
HOLD UP TIME (Typ.)	70ms/230VAC 12ms/115VAC at full load						
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	72%	77%	81%	81%	82%	82%
	AC CURRENT (Typ.)	0.35A/115VAC 0.25A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 65A / 230VAC					
	LEAKAGE CURRENT	<2mA / 240VAC					
PROTECTION	OVERLOAD	Above 105% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	3.8 ~ 4.45V	5.75 ~ 6.75V	13.8 ~ 16.2V	17.25 ~ 20.25V	28.4 ~ 32.4V	55.2 ~ 64.8V
		Protection type : Shut off o/p voltage, clamping by zener diode					
	OVER TEMPERATURE	U1 Tj 140℃ typically (U1) detect on main control IC Protection type : Shut down o/p voltage, recovers automatically after temperature goes down					
ENVIRONMENT	WORKING TEMP.	-20 ~ +70℃ (Refer to "Derating Curve")					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	± 0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 6)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved					
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH					
	EMC EMISSION	Compliance to EN55022 (CISPR22) Class B, EN61000-3-2,-3					
	EMC IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-1, light industry level, criteria A					
OTHERS	MTBF	1608.8Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	62.5*51*28mm (L*W*H)					
	PACKING	0.13Kg; 108pcs/15Kg/0.71CUFT					
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. Line regulation is measured from low line to high line at rated load. 5. Load regulation is measured from 0% to 100% rated load. 6. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com)						

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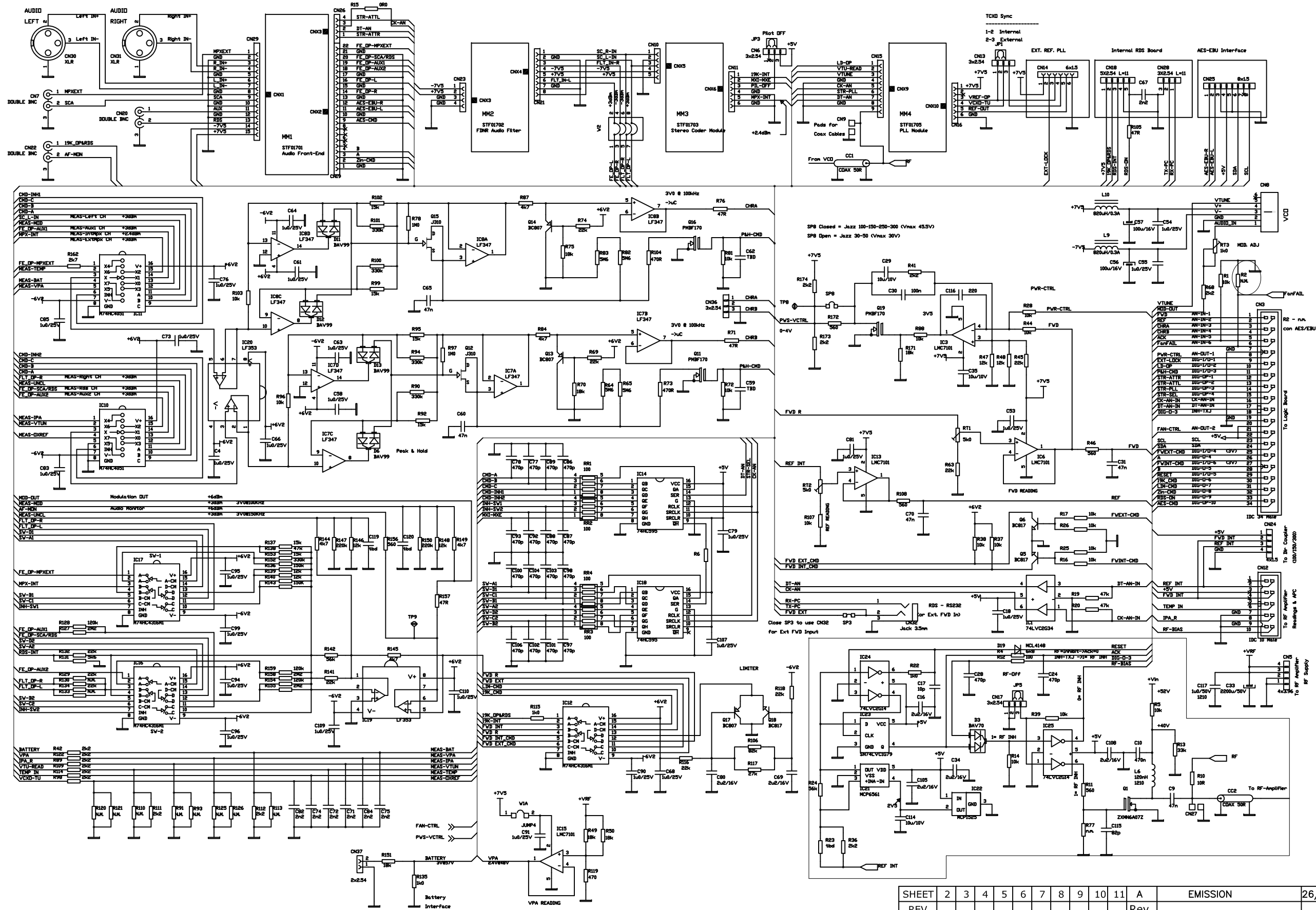


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			Chkd.													
							Scale		Tolerance		DWG. n. SI-902200001D					
											Format A3	Sheet 1 1				

DESCRIPTION		CODE		
2kW VHF FM TRANSMITTER		LP-902200001D		
COD.	DESCRIPTION	P/N	Q.TY	REF.
910000029C	25W FM PREDRIVER		1	GR16
910200046A	2WAY FM SPLITTER AMP/TX 2U		1	GR3
910000042A	1100W FM PALLET AMP (1xBLF178XR)		2	GR4,GR5
910200047A	2KW 2WAY FM COUPLER/LPF		1	GR6
910500031A	RF AMP CONTROL BOARD ASS'Y		1	GR8
910500046A	DISPLAY INTERFACE		1	GR9
910500048A	EXCITER INTERFACE		1	GR10
910500050A	DISPLAY BOARD		1	GR11
910500049A	CONTROL BOARD INTERFACE		1	GR7
910500047B	PWR SUPPLY INTERFACE		1	GR2
910700016A	DC DISTRIBUTION / CONTROL FAN		1	GR15
910500056A	P.S. INTERFACE L 1.6		2	GR17,GR18
0906300007	AC/DC 85-265V/48V-33A 12V-0.5A	HFE1600-48 TDK-LAMBDA	2	GR1,GR19
0906300008	AC/DC IN=85-264V/OUT=15V-1A	RS-15-15 MEAN WELL	1	GR20
913000034A	SEZIONE FM EXCITER		1	
1601000006	VENTOLA AX 80x80x38mm 48VDC 190MC/H	8218JH3 PAPST	3	GR12,GR13,GR14
0530000002	SPINA 16A 250VAC 2P+T		1	J1
0560000038	MORS 4P 2A 380V 2.5mmq P.8mm		1	K2
0421300030	MAGNETOTERM 1P+N 20A 6KA C	MN-C4/20 SIEI PETERLONGO	1	S1
0060000003	VDR O.M. 275V 15KA C.S. P.10mm Q20K275	B72220Q271K101 EPCOS	2	R1,R2

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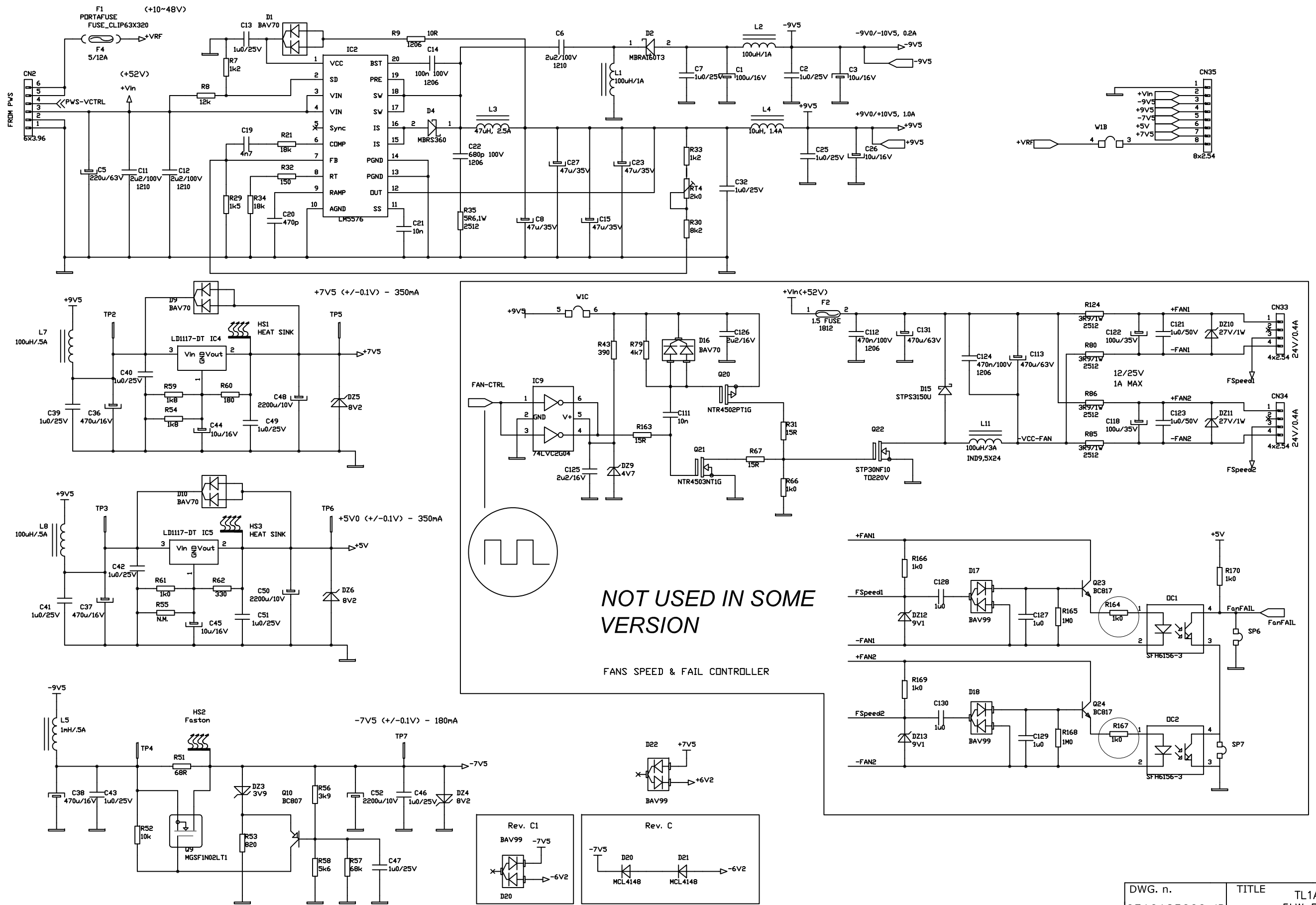
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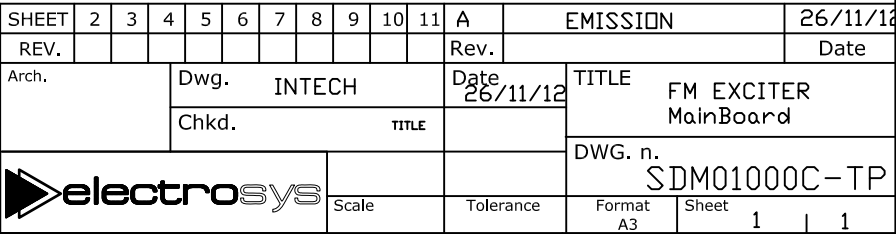
SHEET 2		3	4	5	6	7	8	9	10	11	A	EMISSION		26/11/12
REV.												Rev.		Date
Arch.		Dwg.		INTECH		Date		26/11/12		TITLE		FM Exciter Mainboard		
		Chkd.								DWG. n.		SDM01000C-SE		
										Format		A3		
										Scale		Tolerance		
												Sheet		
												1		
												2		

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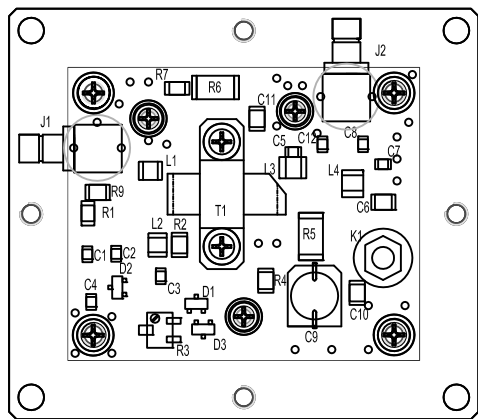


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SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION				26/11/12	
REV.											Rev.					Date	
Arch.				Dwg. INTECH							Date 26/11/12		TITLE 20W VHF PREDRIVER DWG. n. SE-910000029C				
				Chkd.													
									Scale 1:10		Tolerance		Format A4		Sheet 1 1		

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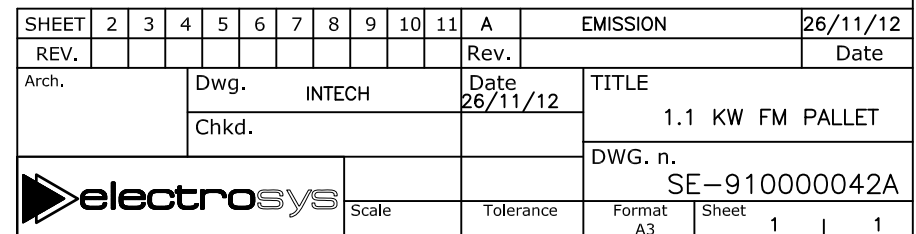


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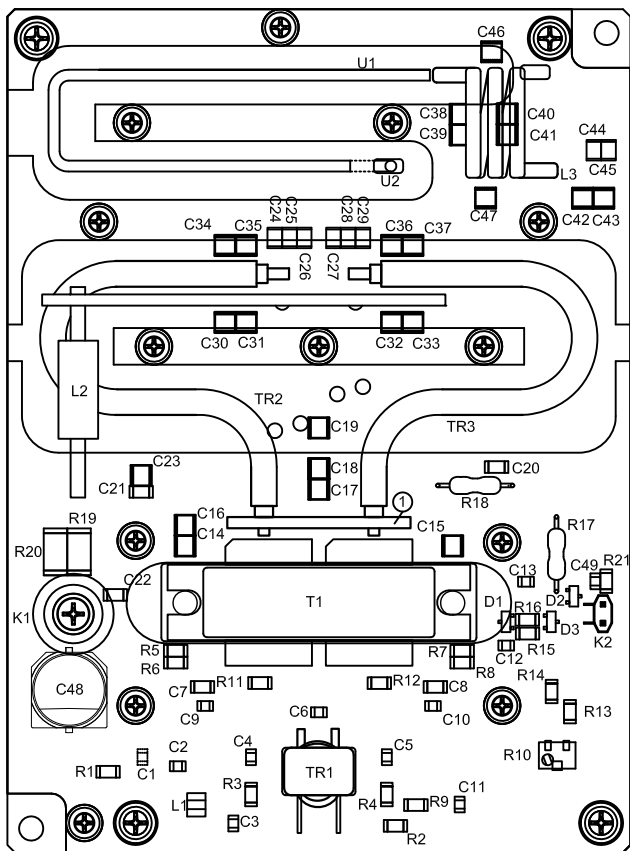
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REV.											Rev.			Date
Arch.		Dwg. INTECH									Date	TITLE 25W FM PALLET		
		Chkd.												
										DWG. n. TP-9100000029C		Format	Sheet	
												A4	1	1
										Scale	Tolerance			

910000029C		25W FM PALLET	PART LIST
DESCRIPTION			CODE
25W FM PALLET			LP-910000029C
CODE	DESCRIPTION	Q.TY	REF.
0146511108	COND CER NP0 RF 220pF 5% 250V 0805 600F	1	C1
0146511000	COND CER NP0 RF 10pF 5% 250V 0805 600F	1	C2
0131516200	COND CER NP0 1nF 5% 500V 1206	3	C3,C6,C11
0147508200	COND CER NP0 1nF 5% 100V 0805	1	C4
0146111812	COND CER NP0 RF 3.3pF 0.25pF 250V 0805 600F	1	C5
0146111820	COND CER NP0 RF 6.8pF 5% 250V 0805 600F	1	C7
0103107100	COND ALL 100uF 20% 50V 105° SMD8.3x8.3xH10.5	1	C9
0141610400	COND CER X7R 100nF 10% 200V 1206	1	C10
0600100000	DIODO 75V 200mA SOT23 BAS16	1	D1
0603100011	DIODO ZENER 3.3V 1/4W SOT23	2	D2,D3
0200100007	IND 47nH 5% 0.45A Q:26 1210	1	L1
0200100012	IND 100nH 5% 0.45A Q:28 1210	1	L2
0200100018	IND ARIA 82nH 2% 2.5A Q:120 1812	2	L3,L4
0523000001	CONN SMB MA CS ANG	2	J1,J2
4060030400	DADO ES M3 OTT NIC UNI5588	1	K1
0003402000	RES F.SP. 10R 1% 1/4W 1206	1	R1
0003402100	RES F.SP. 100R 1% 1/4W 1206	1	R2
0040272300	RES VAR MULT R VERT 10K 10% 1/4W SMD4.9x3.7xH5.3	1	R3
0003402302	RES F.SP. 12K 1% 1/4W 1206	1	R4
0003604704	RES F.SP. 1R5 5% 1W 2512	1	R5
0003604212	RES F.SP. 3K3 5% 1W 2512	1	R6
0003402316	RES F.SP. 47K 1% 1/4W 1206	1	R7
0003402116	RES F.SP. 470R 1% 1/4W 1206	1	R9
0706200009	LDMOS BLF571 50V 20W 500MHz	1	T1
920000150A	C.S. 10W VHF DRIVER - 7543317000	1	
920900158A	CARRIER 10W FM DRIVER REV.1 - 821820700A	1	
4000003004	VITE TC/C M2.5x4 INOX UNI7687	3	
4000004006	VITE TC/C M3x6 INOX UNI7687	6	
4065000400	ROND PIANA M3 INOX UNI6592	2	

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SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION			26/11/12
REV.											Rev.				Date
Arch.			Dwg. INTECH								Date	TITLE PALLET 1100W FM			
			Chkd.								26/11/12				
								Scale		Tolerance		DWG. n. TP-910000041A			
												Format A4 Sheet 1 1			

AGG. 10/10/2012

DESCRIPTION		CODE	
1,1KW FM PALLET 178 XR		LP-910000042A	
CODE	DESCRIPTION	Q.TY	REF.
0146511100	COND CER NP0 RF 100pF 5% 250V 0805 600F	1	C2
0146511012	COND CER NP0 RF 33pF 5% 250V 0805 600F	2	C3,C10
0147608400	COND CER X7R 100nF 10% 100V 0805	2	C4,C5
0146511108	COND CER NP0 RF 220pF 5% 250V 0805 600F	1	C6
0131516200	COND CER NP0 1nF 5% 500V 1206	2	C7,C8
0146511020	COND CER NP0 RF 68pF 5% 250V 0805 600F	1	C9
0147608300	COND CER X7R 10nF 10% 100V 0805	4	C11,C12,C13,C49
0150516008	COND POR 22pF 5% 500V SMD2.8x2.8 100B	5	C14,C15,C38,C39,C40
0150116816	COND POR 4.7pF 0.25pF 500V SMD2.8x2.8 100B	1	C16
0150616002	COND POR 12pF 5% 500V SMD2.8x2.8 100B	3	C17,C18,C19
0141610400	COND CER X7R 100nF 10% 200V 1206	3	C20,C21,C22
0150610116	COND POR 470pF 5% 200V SMD2.8x2.8 100B	9	C23,C24,C25,C26,C27,C28,C29,C44,C45
0150607200	COND POR 1nF 10% 50V SMD2.8x2.8 100B	8	C30,C31,C32,C33,C34,C35,C36,C37
0150616006	COND POR 18pF 5% 500V SMD2.8x2.8 100B	1	C41
0150616002	COND POR 12pF 5% 500V SMD2.8x2.8 100B	2	C42,C43
	NOT USED	0	C46,C47
0103307100	COND ALL 100uF 20% 63V 105° SMD10.3x10.3xH10.5	1	C48
0200100002	IND 22nH 5% 0.45A Q:23 1210	1	L1
1430000005	FILO RAME ARG D:2mm	3	L2
1502000001	NUCLEO TORO EMI 155R @ 100MHz D:6 d:3.15 L:18	1	L2
	AIR INDUCTOR 60 nH 2.75 SP D=10 FILO D= 2	1	L3
0003402700	RES F.SP. 1R 1% 1/4W 1206	4	R1,R2,R3,R4
0003402012	RES F.SP. 33R 1% 1/4W 1206	5	R5,R6,R7,R8,R9
0040272217	RES VAR MULT R VERT 5K 10% 1/4W SMD4.9x3.7xH5.3	1	R10
0003402099	RES F.SP. 0R 1% 1/4W 1206	3	R11,R12,R13
0003402212	RES F.SP. 3K3 1% 1/4W 1206	1	R14
0003402012	RES F.SP. 33R 1% 1/4W 1206	2	R15,R16
0002402217	RES S.M. 5K1 1% 1/4W	2	R17,R18
0003405900	RES F.SP. 0R01 1% 3W SMD 2512	2	R19,R20
0003402400	RES F.SP. 100K 1% 1/4W 1206	1	R21
0600100000	DIODO 75V 200mA SOT23 BAS16	2	D1,D2
0603100004	DIODO ZENER 3.9V 1/4W SOT23	1	D3
4070132120	DIST ES FF M4x12 OTT NIC	1	K1
4001305008	VITE TC/I M4x8 OTT NIC UNI6107	1	K1

26/11/2012

Rev. 0

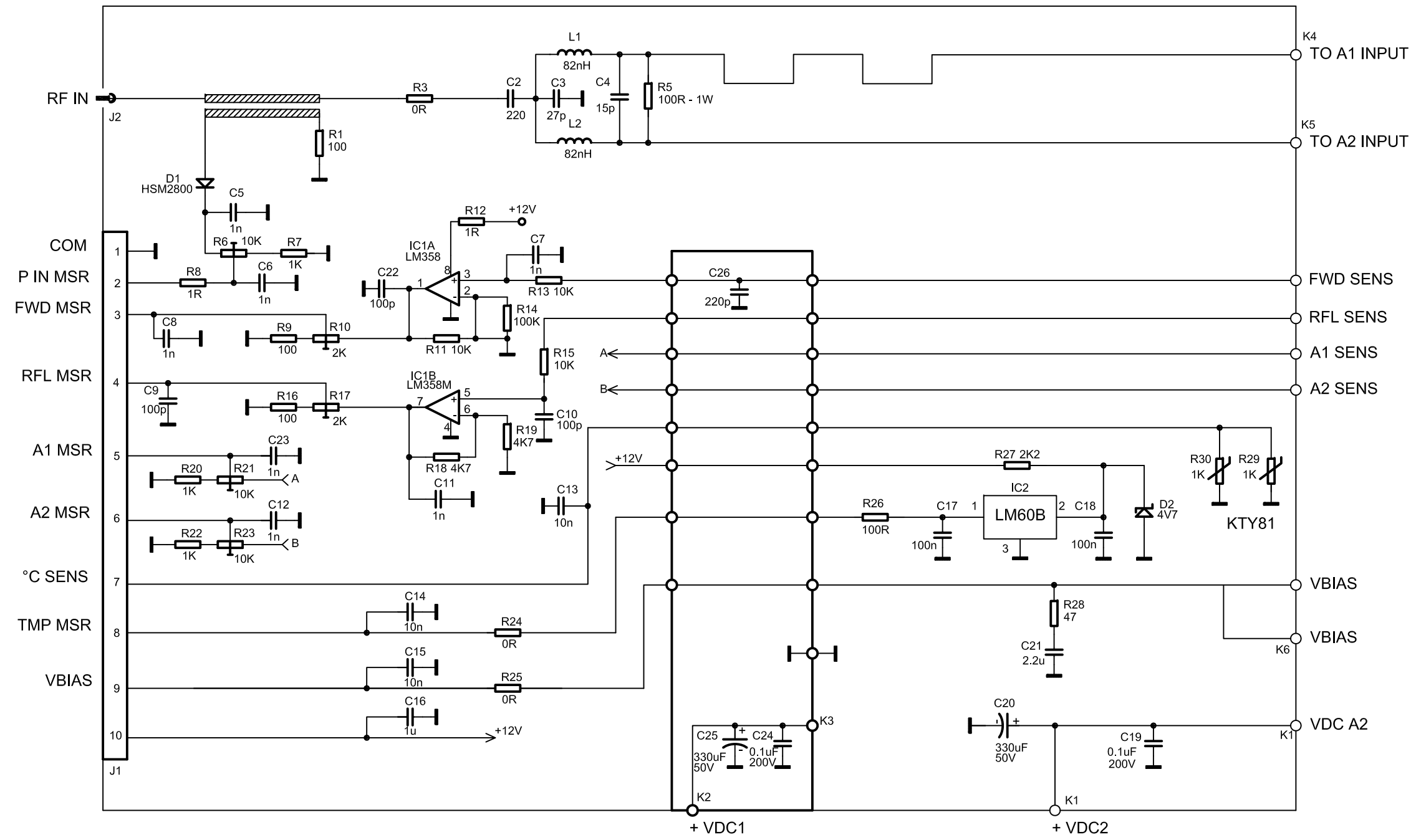
Page 1 of 2

AGG. 10/10/2012

0503020005	CONN PETTINE 1x40P MA ANG CS	0,05	K2 (2P)
0706200008	LDMOS TRANS 108MHz 1200W 50V BLF178XR	1	T1
1501000005	NUCLEO FT606 F40 9.7x5.8x6.2	1	TR1
1400000024	CAVO WIRE-WRAP AWG30 TEFZEL RO	12	TR1
1430000003	FILO RAME ARG D:1mm	5	TR1
1403000016	CAVO COAX 25R HF141 PREFORMABILE	18	TR2,TR3
1430000004	FILO RAME ARG D:1.5mm	12	U1
1430000004	FILO RAME ARG D:1.5mm	14	U2 (LATO MASSA)
92000208A0	C.S. KIT RF 1100W FM PALLET	1	1,2
92000199A0	C.S. 1100W FM PALLET (1xBLF178XR)	1	
920900209A	CARRIER 1100W FM PALLET (1xBLF178XR) - 8218226000	1	
4000003006	VITE TC/C M2.5x6 INOX UNI7687	12	

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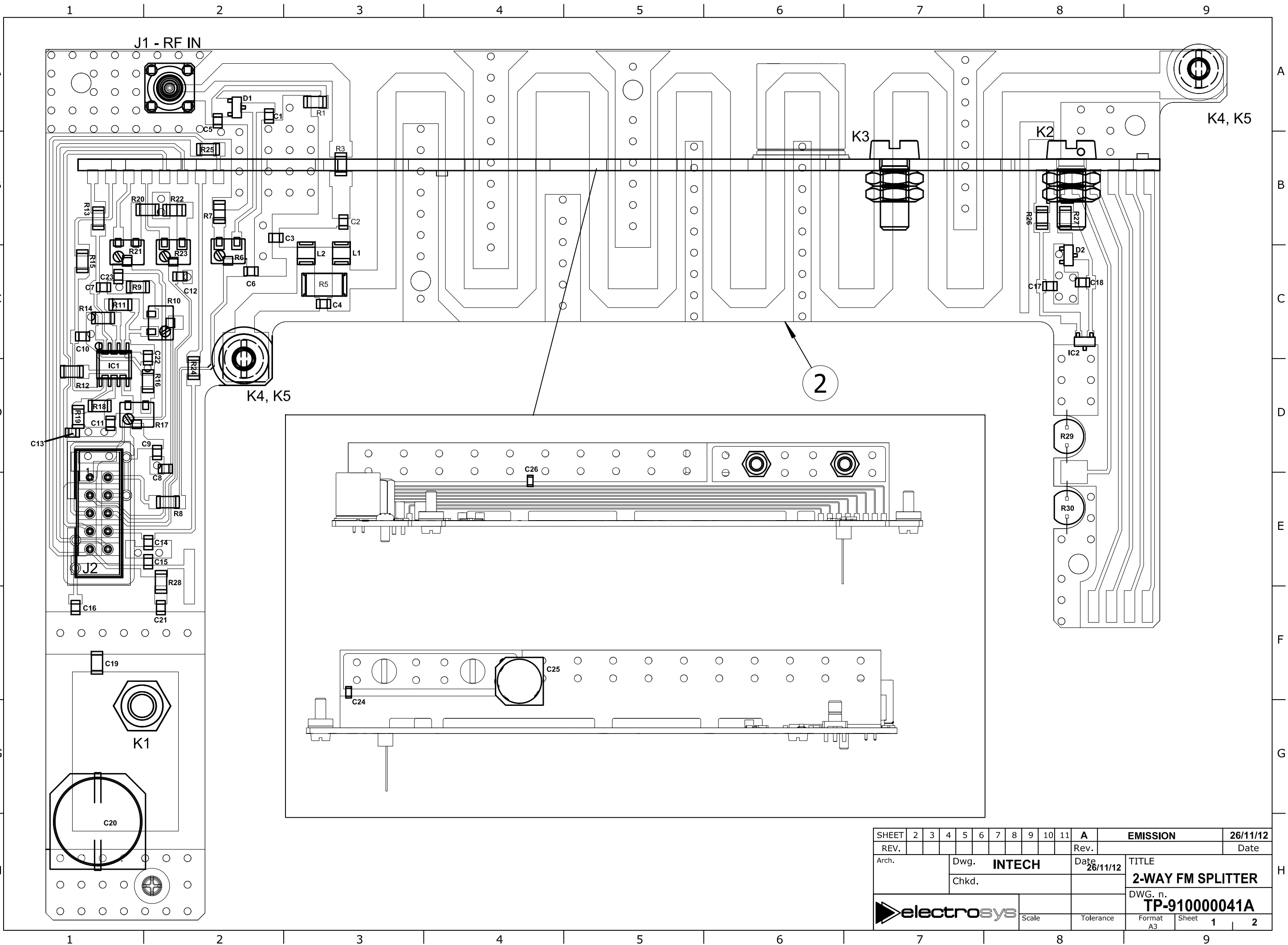


SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION			26/11/12	
REV.											Rev.				Date	
Arch.				Dwg. INTECH							Date 26/11/12		TITLE 2WAY SPLITTER FM TX 2U			
				Chkd.												
										Scale		Tolerance		DWG. n.		
														SE-910200046A		
														Format A3	Sheet 1	1



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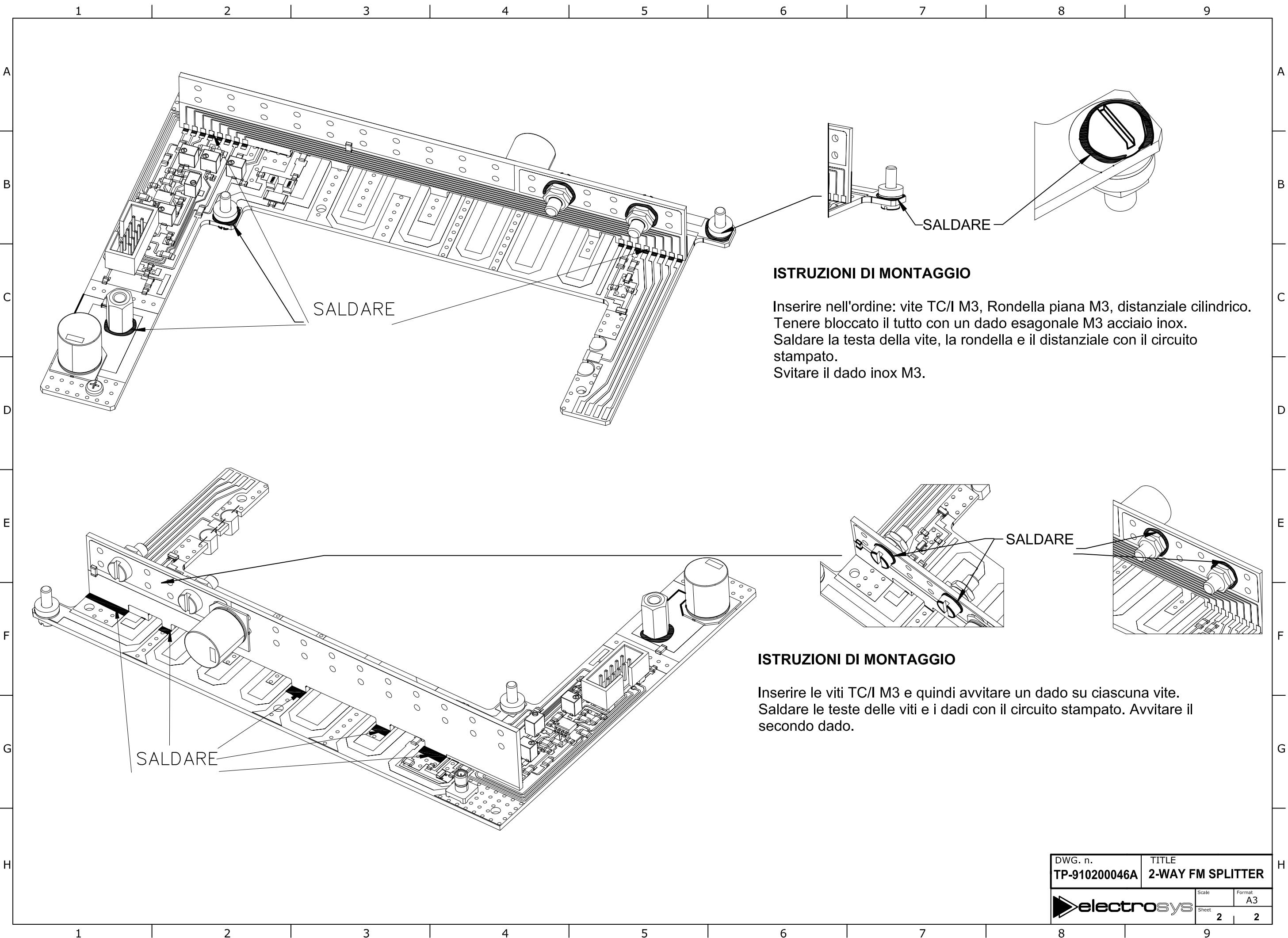
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SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION			26/11/12
REV.											Rev.				Date
Arch.				Dwg.				INTECH				Date		TITLE	
				Chkd.								26/11/12		2-WAY FM SPLITTER	
								Scale				Tolerance		DWG. n.	
														TP-910000041A	
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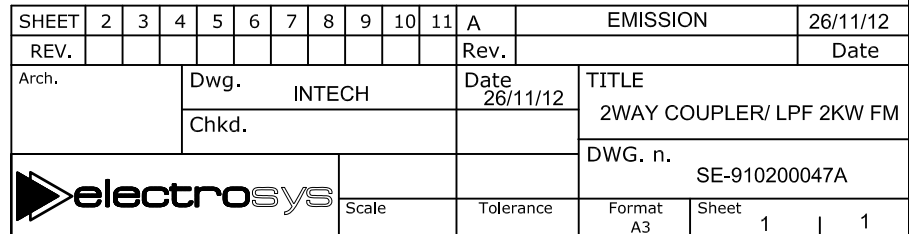
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DWG. n.	TITLE		
TP-910200046A	2-WAY FM SPLITTER		
	Scale	Format	
	Sheet	2	2

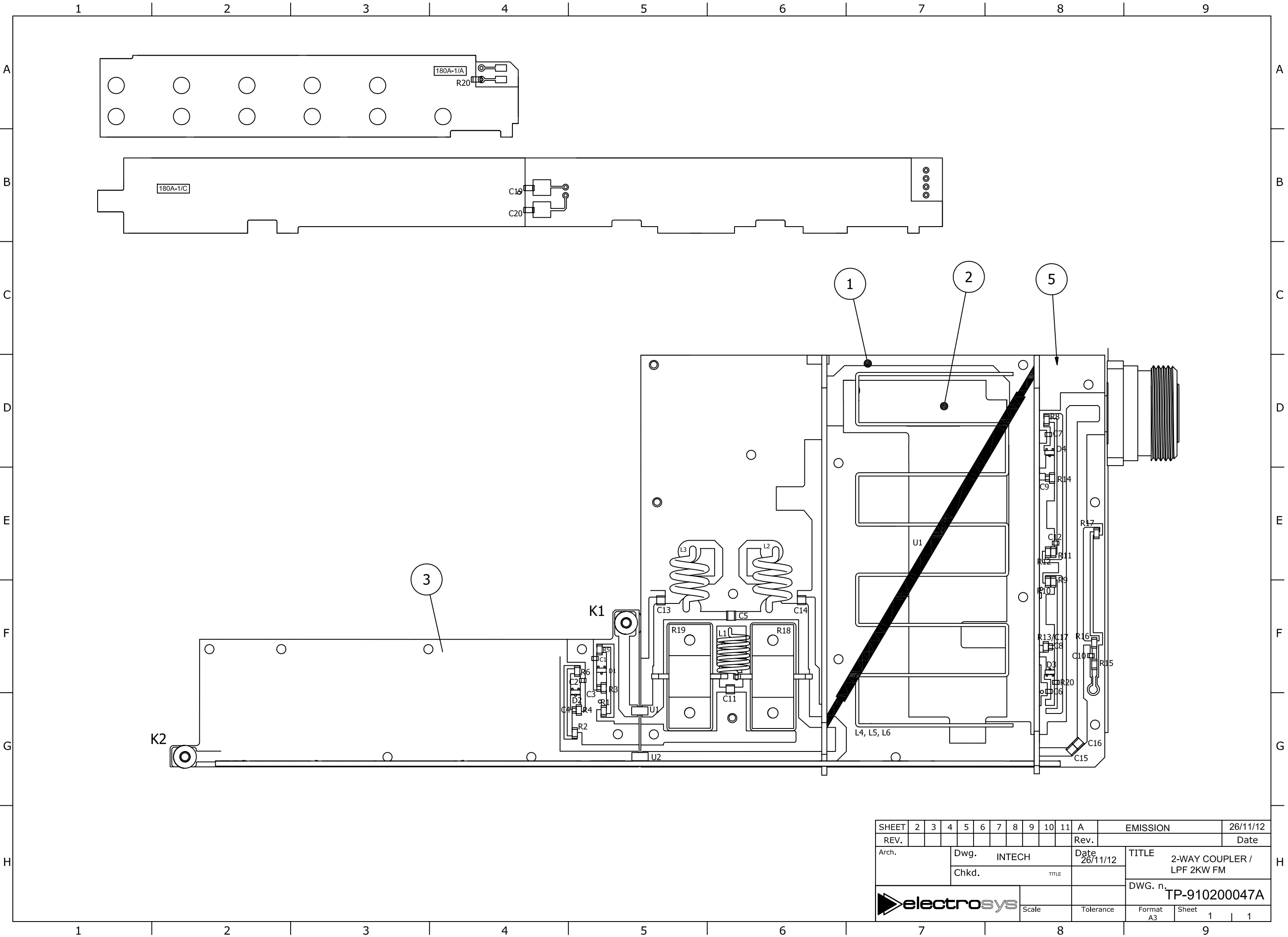
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	2WAY FM SPLITTER AMP/TX 2U		LP-910200046A
CODE	DESCRIPTION	Q.TY	REF.
0003402100	RES F.SP. 100R 1% 1/4W 1206	1	R1,R9,R16,R26
0003402099	RES F.SP. 0R 1% 1/4W 1206	3	R3,R24,R25
0003604100	RES F.SP. 100R 5% 1W 2512	1	R5
0040272300	RES VAR MULT R VERT 10K 10% 1/4W SMD4.9x3.7xH5.3	3	R6,R21,R23
0003402200	RES F.SP. 1K 1% 1/4W 1206	3	R7,R20,R22
0003402700	RES F.SP. 1R 1% 1/4W 1206	2	R8,R12
0040272207	RES VAR MULT R VERT 2K 10% 1/4W SMD4.9x3.7xH5.3	2	R10,R17
0003402300	RES F.SP. 10K 1% 1/4W 1206	3	R11,R13,R15
0003402400	RES F.SP. 100K 1% 1/4W 1206	1	R14
0003402216	RES F.SP. 4K7 1% 1/4W 1206	2	R18,R19
0003402208	RES F.SP. 2K2 1% 1/4W 1206	1	R27
0003402016	RES F.SP. 47R 1% 1/4W 1206	1	R28
1320000002	SENS TEMP -50/+150° 990-1010 OHM SOD70	2	R29,R30
0146511108	COND CER NP0 RF 220pF 5% 250V 0805 600F	1	C2
0146511010	COND CER NP0 RF 27pF 5% 250V 0805 600F	1	C3
0146511004	COND CER NP0 RF 15pF 5% 250V 0805 600F	1	C4
0147508200	COND CER NP0 1nF 5% 100V 0805	7	C5,C6,C7,C8,C11,C12,C23
0147508100	COND CER NP0 100pF 5% 100V 0805	3	C9,C10,C22
0147608300	COND CER X7R 10nF 10% 100V 0805	3	C13,C14,C15
0147607500	COND CER X7R 1uF 10% 50V 0805	1	C16
0147608400	COND CER X7R 100nF 10% 100V 0805	2	C17,C18
0141610400	COND CER X7R 100nF 10% 200V 1206	2	C19,C24
0103307112	COND ALL 330uF 20% 50V 105° LOW ESR SMD12.8x12.8xH14	2	C20,C25
0141607508	COND CER X7R 2.2uF 10% 50V 1206	1	C21
0131516108	COND CER NP0 220pF 5% 500V 1206	1	C26
0601100000	DIODO SCHOTTKY SOT23 HSMS-2800	1	D1
0603100000	DIODO ZENER 4.7V 1/4W SOT23	1	D2
0200100018	IND ARIA 82nH 2% 2.5A Q:120 1812	2	L1,L2
0800100001	C.I. 2 OP AMP LM358 SO8	1	IC1
1320100001	SENS TEMP -25+125° LIN +6.25mV/° LM60B SOT23	1	IC2
0503040000	CONN DIN41651 2x5P MA CS	1	J1
0523000000	CONN SMB MA CS	1	J2
4070132120	DIST ES FF M4x12 OTT NIC	1	K1
4001305010	VITE TC/I M4x10 OTT NIC UNI6107	2	K2,K3
4060030500	DADO ES M4 OTT NIC UNI5588	4	K2,K3
4070331030	DIST CIL d3.2xH3mm OTT NIC	2	K4,K5
4001304010	VITE TC/I M3x10 OTT NIC UNI6107	2	K4,K5
4065030400	ROND PIANA M3 OTT ARG UNI6592	2	K4,K5
920000180A	C.S. KIT SHIELD/SIGNALS (SEZ. COD. 920000180A)	1	1
920000176A	C.S. 2WAY FM SPLITTER REV.1	1	2

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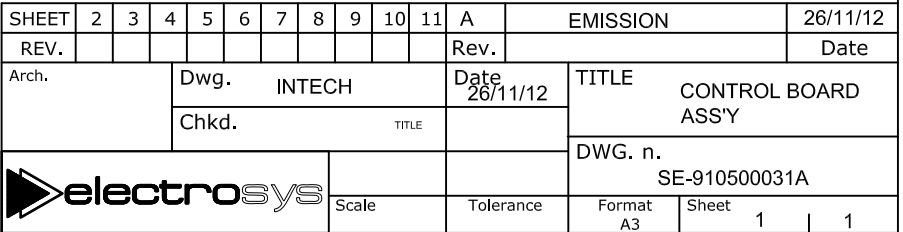
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SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION		26/11/12
REV.												Rev.		Date
Arch.			Dwg.			INTECH			Date			26/11/12		
			Chkd.			TITLE						TITLE		
												DWG. n.		
												TP-910200047A		
						Scale			Tolerance			Format	Sheet	
												A3	1	1

	DESCRIPTION		CODE
	2KW 2WAY FM COUPLER/LPF		LP-910200047A
CODE	DESCRIPTION	Q.TY	REF.
0003402100	RES F.SP. 100R 1% 1/4W 1206	2	R1,R2
0003402400	RES F.SP. 100K 1% 1/4W 1206	4	R3,R4,R13,R14
0003402012	RES F.SP. 33R 1% 1/4W 1206	4	R5,R6,R7,R8
0003402104	RES F.SP. 150R 1% 1/4W 1206	4	R9,R10,R11,R12
0003402017	RES F.SP. 51R 1% 1/4W 1206	2	R15,R16
0003402021	RES F.SP. 75R 1% 1/4W 1206	1	R17
0020618017	RES RF 50R 5% 500W DC-1GHz	2	R18,R19
	AIR INDUCTOR 200nH (6SP. D=8 FILO D=1 L=12mm)	0	L1
	AIR INDUCTOR 50nH (3SP. D=8FILO D=2 L= 14mm)	0	L2,L3
922300082A	LINEA RF INDUCTOR LPF FM 473x13-Cu SP=1mm-ARG 10u	1	L4,L5,L6
0146511004	COND CER NPO RF 15pF 5% 250V 0805 600F	2	C1,C2
0146511108	COND CER NPO RF 220pF 5% 250V 0805 600F	4	C3,C4,C8,C9
0150116820	COND POR 6.8pF 5% 500V SMD2.8x2.8 100B	1	C5
0146511018	COND CER NPO RF 56pF 5% 250V 0805 600F	1	C6
0146511012	COND CER NPO RF 33pF 5% 250V 0805 600F	1	C7
0146511100	COND CER NPO RF 100pF 5% 250V 0805 600F	1	C10
0150116816	COND POR 4.7pF 0.25pF 500V SMD2.8x2.8 100B	1	C11
0146111816	COND CER NPO RF 4.7pF 0.25pF 250V 0805 600F	1	C12
0150116808	COND POR 2.2pF 0.25pF 500V SMD2.8x2.8 100B	4	C13,C14,C15,C16
0601100000	DIODO SCHOTTKY SOT23 HSMS-2800	4	D1,D2,D3,D4
4001304010	VITE TC/I M3x10 OTT NIC UNI6107	2	K1,K2
4065030400	ROND PIANA M3 OTT ARG UNI6592	2	K1,K2
4070331030	DIST CIL d3.2xH3mm OTT NIC	1	K1,K2
920000178A	C.S. 2WAY FM COMBINER/LPF REV1	1	1,2,3
920000180A	C.S. KIT SHIELD/SIGNALS FM COMB/LPF REV1	1	5

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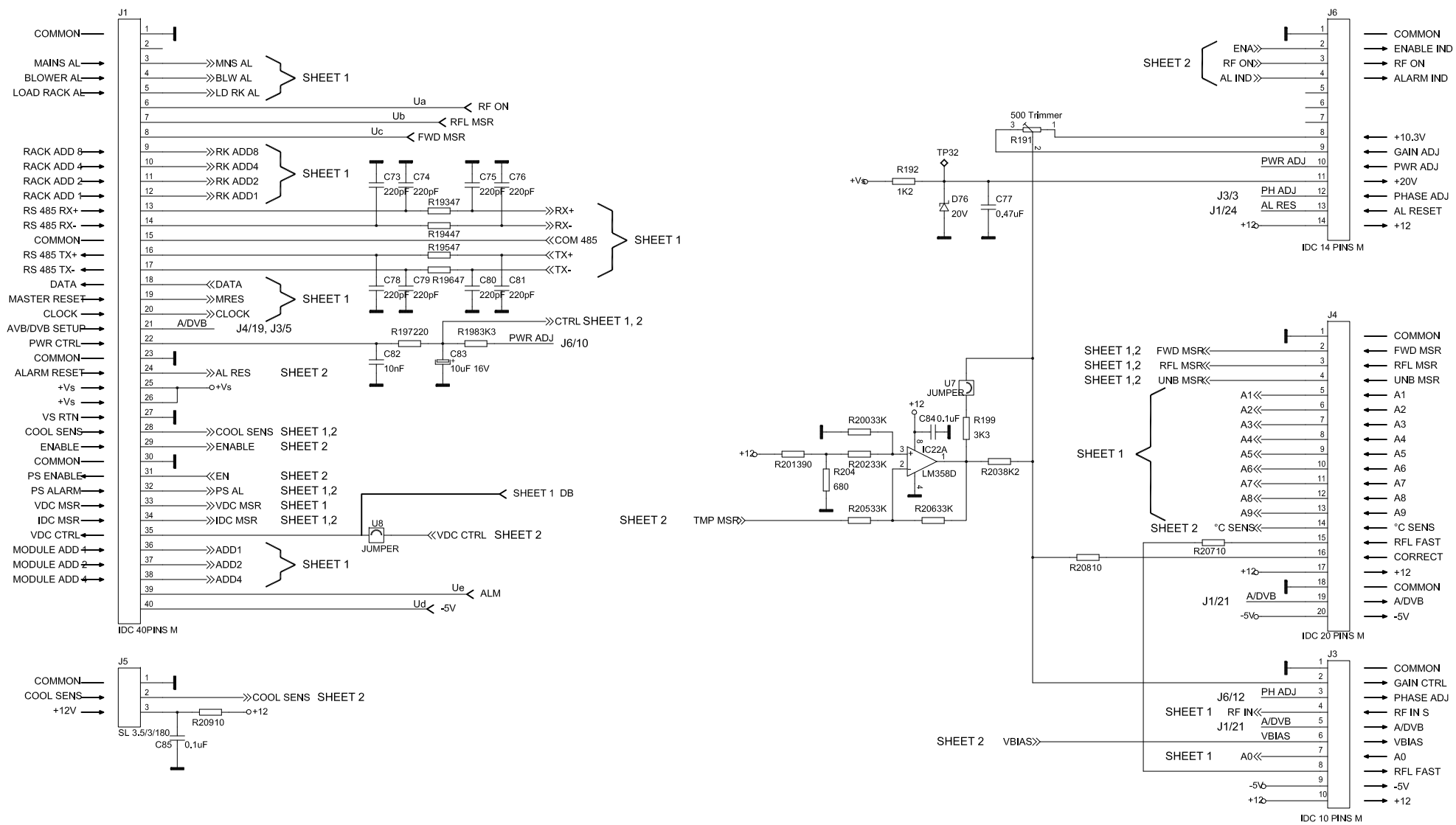


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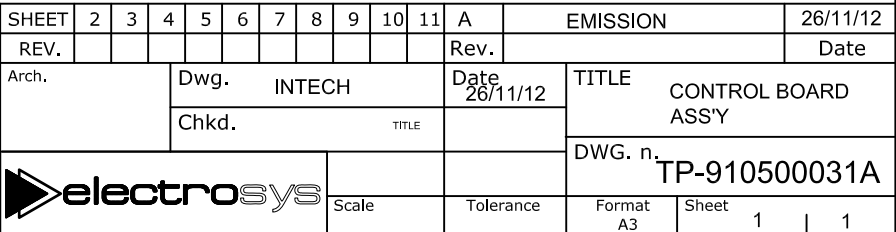
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DWG. n.	TITLE	
SE-910500031A	CONTROL BOARD ASS'Y	
	Scale	Format
	Sheet	A3
	3	3

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	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C1
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C2
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C3
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	1	C4
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C5
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C6
029L4100D1	CAP SMD 0805 COG 1nF 100V	2	C7,8
029L5100D1	CAP SMD 0805 X7R 10nF 100V	2	C9,10
029L4100D1	CAP SMD 0805 COG 1nF 100V	1	C11
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C12
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C13
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C14
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C15
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	1	C16
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C17
029L6100D1	CAP SMD 0805 X7R 100nF 100V	2	C18,19
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	2	C20,21
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C22
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	2	C23,24
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C25
025F3100E0	CAP ELETT.100μF 35V SMD 105 6,3 x 8	2	C26,27
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C28
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	1	C29
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C30
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C31
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C32
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C33
029L5100D1	CAP SMD 0805 X7R 10nF 100V	3	C34...36
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	1	C37
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C38
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C39
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C40
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C41
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C42
029L4100D1	CAP SMD 0805 COG 1nF 100V	1	C43
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C44
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C45
029L6100D1	CAP SMD 0805 X7R 100nF 100V	5	C46...50
029L4100D1	CAP SMD 0805 COG 1nF 100V	1	C51
029L6100D1	CAP SMD 0805 X7R 100nF 100V	2	C52,53
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C54
029L6100D1	CAP SMD 0805 X7R 100nF 100V	4	C55...58
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C59
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C60
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C61
029L3100D1	CAP SMD 0805 COG 100pF 100V	1	C62
029L6100D1	CAP SMD 0805 X7R 100nF 100V	1	C63

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C64
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C65
029L6100D1	CAP SMD 0805 X7R 100nF 100V	2	C66,67
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C68
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C69
029L6100D1	CAP SMD 0805 X7R 100nF 100V	3	C70...72
029L3220D1	CAP SMD 0805 COG 220pF 100V	4	C73...76
029L6470D0	CAP SMD 0805 X7R 0,47uF 50V	1	C77
029L3220D1	CAP SMD 0805 COG 220pF 100V	4	C78...81
029L5100D1	CAP SMD 0805 X7R 10nF 100V	1	C82
025D2100E0	CAP ELETT. 10uF 16V 105 SMD 4x5,5	1	C83
029L6100D1	CAP SMD 0805 X7R 100nF 100V	2	C84,85
06WRD08050	LED ROSSO SMD 0805	1	D1
	DIODE 1N4148	2	DA, DB
06JABAS160	DIODO SMD BAS16 SOT 23	5	D2...6
06WRD08050	LED ROSSO SMD 0805	1	D7
06JBAS7070	DUAL DIODE SMD BAS70-7 SOT143	4	D8...11
06JBAS7070	DUAL DIODE SMD BAS70-7 SOT143	8	D14...21
06JABAS160	DIODO SMD BAS16 SOT 23	1	D22
06WRD08050	LED ROSSO SMD 0805	1	D23
06JABAS160	DIODO SMD BAS16 SOT 23	1	D24
06WRD08050	LED ROSSO SMD 0805	2	D25,26
06JABAS160	DIODO SMD BAS16 SOT 23	1	D27
06WRD08050	LED ROSSO SMD 0805	1	D28
06JABAS160	DIODO SMD BAS16 SOT 23	1	D29
06WRD08050	LED ROSSO SMD 0805	1	D30
06JABAS160	DIODO SMD BAS16 SOT 23	1	D31
06WRD08050	LED ROSSO SMD 0805	1	D32
06JABAS160	DIODO SMD BAS16 SOT 23	1	D33
06WRD08050	LED ROSSO SMD 0805	1	D34
06JABAS160	DIODO SMD BAS16 SOT 23	1	D35
06WRD08050	LED ROSSO SMD 0805	1	D36
06JABAS160	DIODO SMD BAS16 SOT 23	1	D37
06WRD08050	LED ROSSO SMD 0805	1	D38
06JABAS160	DIODO SMD BAS16 SOT 23	1	D39
06WRD08050	LED ROSSO SMD 0805	1	D40
06JABAS160	DIODO SMD BAS16 SOT 23	1	D41
06WRD08050	LED ROSSO SMD 0805	1	D42
06JABAS160	DIODO SMD BAS16 SOT 23	1	D43
06WRD08050	LED ROSSO SMD 0805	1	D44
06JABAS160	DIODO SMD BAS16 SOT 23	3	D45...47
06WRD08050	LED ROSSO SMD 0805	1	D48
06JABAS160	DIODO SMD BAS16 SOT 23	3	D49...51
06WRD08050	LED ROSSO SMD 0805	1	D52
06JABAS160	DIODO SMD BAS16 SOT 23	7	D53...59
06JABAS160	DIODO SMD BAS16 SOT 23	1	D61
06WRD08050	LED ROSSO SMD 0805	1	D62

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
06JABAS160	DIODO SMD BAS16 SOT 23	1	D63
06WRD08050	LED ROSSO SMD 0805	1	D64
06JABAS160	DIODO SMD BAS16 SOT 23	7	D65...71
06HC05V600	DIODO ZENER SMD 5,6V 300mW	1	D72
06JABAS160	DIODO SMD BAS16 SOT 23	1	D73
06HC04V700	DIODO ZENER SMD 4,7V 300mW	1	D74
06WRD08050	LED ROSSO SMD 0805	1	D75
06HC20V000	DIODE ZENER 20V 0,3W SMD SOT23	1	D76
09A4067000	CIRC INTEGR HEF4067BT SMD	1	IC1
09A4040001	CIRC INTEGR HEF4040BT SMD	1	IC2
093M317001	CIRC. INTEGR LM317EMP SMD	1	IC3
093M340000	CIRC. INTEGR LM340T12	1	IC4
1130000014	CONV DC/DC 1W IN 12V OUT 5V	1	IC5
09A4017001	CIRC INTEGR HEF4017BT SMD	1	IC6
091M324000	CIRC INT LM324D SMD	3	IC11...13
091M358001	CIRC INT LM358D SMD	1	IC14
09A4049000	CIRC INTEGR HEF4049BT SMD	1	IC15
091M324000	CIRC INT LM324D SMD	2	IC16,17
09A4049000	CIRC INTEGR HEF4049BT SMD	1	IC18
0994081001	CIRC. INTEGR HEF4081BT SMD	1	IC19
09A4071000	CIRC INTEGR HEF4071BT SMD	1	IC20
091M358001	CIRC INT LM358D SMD	1	IC22
09A4051000	CIRC INTEGR HEF4051BT SMD	1	IC23
091M324000	CIRC INT LM324D SMD	1	IC24
093M311000	CIRC. INTEGR LM311D SMD	1	IC25
095555N001	CIRC. INTEGR LM 555 SMD	1	IC26
125DM40000	CONN M 40P DBL PCB	1	J1
125DM10001	CONN 10 PIN CS MA	1	J3
125DM20000	CONN 20 PIN CS MA	1	J4
127DF03001	MORSETTIERA CS 3 POLI 3.5 (PK5603)	1	J5
125DM14001	CONN 14 PIN CS MA	1	J6
125DM10000	CONN D M 2X5 POLI CS	2	J7,8
125DM64000	CONN M 2X32 POLI CS	1	J9
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R1
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R2
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R3
00SC3220D0	RES SMD 1206 220 Ohm 1/4 W	1	R4
00SC4220D0	RES SMD 1206 2,2kOhm 1/4 W	1	R5
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R6
00SC7220D0	RES SMD 1206 2,2 MOhm 1/4W	1	R7
00SC2220D0	RES SMD 1206 22 Ohm 1/4 W	1	R8
00SC6100D0	RES SMD 1206 100 kOhm 1/4 W	1	R9
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R10
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R11
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R12
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R13
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R14

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
00SC2100D0	RES SMD 1206 10 Ohm 1/4W	2	R15,16
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	2	R17,18
00SC6100D0	RES SMD 1206 100 kOhm 1/4 W	1	R19
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R20
00SC3100D0	RES SMD 1206 100 Ohm 1/4 W	1	R21
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R22
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R23
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R24
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R25
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R26
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R27
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R28
00SC5470D0	RES SMD 1206 47 kOhm 1/4W	1	R29
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R30
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R31
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R32
00SC6100D0	RES SMD 1206 100 kOhm 1/4 W	1	R33
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	2	R34,35
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R36
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R37
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	2	R38,39
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R40
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R41
00SE2100D0	RES SMD 2510 10 Ohm 1 W	1	R42
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R43
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R44
00SC3220D0	RES SMD 1206 220 Ohm 1/4 W	1	R45
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R46
00SC3470D0	RES SMD 1206 470 Ohm 1/4 W	1	R47
00LC3200F0	TRIMM SMD MULTI 200 Ohm 1/4W	1	R48
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R49
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R50
007F2100D0	RES 10 Ohm 3W	1	R51
00SC2100D0	RES SMD 1206 10 Ohm 1/4W	1	R52
00SC3330D0	RES SMD 1206 330 Ohm 1/4W	1	R53
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R54
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R55
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R56
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R57
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R58
00SC4390D0	RES SMD 1206 3,9 kOhm 1/4W	1	R59
00SC5470D0	RES SMD 1206 47 kOhm 1/4W	1	R60
00SC6180D0	RES SMD 1206 180 kOhm 1/4 W	1	R61
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R62
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R63
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R64
00SC5470D0	RES SMD 1206 47 kOhm 1/4W	1	R65

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
00SC5680D0	RES SMD 1206 68 kOhm 1/4W	1	R66
00SC2100D0	RES SMD 1206 10 Ohm 1/4W	2	R67,68
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R69
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R70
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R71
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R72
00SC2100D0	RES SMD 1206 10 Ohm 1/4W	1	R73
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R74
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R75
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R76
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R77
00SC4680D0	RES SMD 1206 6,8 kOhm 1/4W	1	R78
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	2	R79,80
00SC3560D0	RES SMD 1206 560 Ohm 1/4 W	1	R81
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R82
00SC6470D0	RES SMD 1206 470 kOhm 1/4W	1	R83
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R84
00SC7470D0	RES SMD 1206 4,7 MOhm 1/4W	1	R85
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R86
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R87
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R88
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R89
00SC5330D0	RES SMD 1206 33 kOhm 1/4W	1	R90
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	2	R91,92
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R93
00SC7220D0	RES SMD 1206 2,2 MOhm 1/4W	1	R94
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R95
00LC5100F0	TRIM SMD MULTI 10kOhm 1/4W	1	R96
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R97
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R98
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R99
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R100
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R101
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R102
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R103
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R104
00SC4680D0	RES SMD 1206 6,8 kOhm 1/4W	1	R105
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R106
00SC6330D0	RES SMD 1206 330 kOhm 1/4W	1	R107
00LC5100F0	TRIM SMD MULTI 10kOhm 1/4W	1	R108
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R109
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R110
00SC2100D0	RES SMD 1206 10 Ohm 1/4W	1	R111
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	2	R112,113
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R114
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	2	R115,116
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R117

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R118
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R119
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R120
00SC3330D0	RES SMD 1206 330 Ohm 1/4W	1	R121
00SC2820D0	RES SMD 1206 82 Ohm 1/4W	1	R122
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R123
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R124
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R125
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R126
00SC4220D0	RES SMD 1206 2,2kOhm 1/4 W	1	R127
00SC6330D0	RES SMD 1206 330 kOhm 1/4W	1	R128
00SC7470D0	RES SMD 1206 4,7 MOhm 1/4W	1	R129
00SC7220D0	RES SMD 1206 2,2 MOhm 1/4W	1	R130
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R131
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R132
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	2	R133,134
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R135
00SC7470D0	RES SMD 1206 4,7 MOhm 1/4W	1	R136
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R137
00SC7470D0	RES SMD 1206 4,7 MOhm 1/4W	1	R138
00SC4220D0	RES SMD 1206 2,2kOhm 1/4 W	1	R139
00SC7220D0	RES SMD 1206 2,2 MOhm 1/4W	2	R140,141
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R142
00SC3330D0	RES SMD 1206 330 Ohm 1/4W	1	R143
00LC4100F0	TRIMM SMD MULTI 1 kOhm 1/4W	1	R144
00SC3100D0	RES SMD 1206 100 Ohm 1/4 W	1	R145
00SC4150D0	RES SMD 1206 1.5 kOhm 1/4W	1	R146
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	2	R147,148
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R149
00SC4220D0	RES SMD 1206 2,2kOhm 1/4 W	1	R150
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R151
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R152
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R153
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	2	R154,155
00SC6330D0	RES SMD 1206 330 kOhm 1/4W	1	R156
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R157
00SC2470D0	RES SMD 1206 47 Ohm 1/4 W	1	R158
00SC3390D0	RES SMD 1206 390 Ohm 1/4 W	1	R159
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	2	R160,161
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	2	R162,163
00SC4100D0	RES SMD 1206 1 kOhm 1/4 W	1	R164
00SC6330D0	RES SMD 1206 330 kOhm 1/4W	1	R165
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R166
00SC2220D0	RES SMD 1206 22 Ohm 1/4 W	1	R167
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	2	R168,169
00SC3150D0	RES SMD 1206 150 Ohm 1/4 W	1	R170
00SC4220D0	RES SMD 1206 2,2kOhm 1/4 W	1	R171

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R172
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R173
00SC6100D0	RES SMD 1206 100 kOhm 1/4 W	1	R174
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R175
00SC3470D0	RES SMD 1206 470 Ohm 1/4 W	1	R176
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R177
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R178
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R179
00SC7100D0	RES SMD 1206 1 MOhm 1/4W	1	R180
00SC4120D0	RES SMD 1206 1,2 kOhm 1/4 W	1	R181
00SC3100D0	RES SMD 1206 100 Ohm 1/4 W	1	R182
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R183
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R184
00SC5100D0	RES SMD 1206 10 kOhm 1/4 W	1	R185
00SC5220D0	RES SMD 1206 22 kOhm 1/4W	1	R186
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R187
00SC6100D0	RES SMD 1206 100 kOhm 1/4 W	1	R188
00SC2470D0	RES SMD 1206 47 Ohm 1/4 W	1	R189
00SC4470D0	RES SMD 1206 4.7 kOhm 1/4 W	1	R190
00LC3500F0	TRIMM SMD MULTI 500 Ohm 1/4W	1	R191
00SC4120D0	RES SMD 1206 1,2 kOhm 1/4 W	1	R192
00SC2470D0	RES SMD 1206 47 Ohm 1/4 W	4	R193..196
00SC3220D0	RES SMD 1206 220 Ohm 1/4 W	1	R197
00SC4330D0	RES SMD 1206 3.3 kOhm 1/4 W	2	R198,199
00SC5330D0	RES SMD 1206 33 kOhm 1/4W	1	R200
00SC3390D0	RES SMD 1206 390 Ohm 1/4 W	1	R201
00SC5330D0	RES SMD 1206 33 kOhm 1/4W	1	R202
00SC4820D0	RES SMD 1206 8,2 kOhm 1/4W	1	R203
00SC3680D0	RES SMD 1206 680 Ohm 1/4W	1	R204
00SC5330D0	RES SMD 1206 33 kOhm 1/4W	2	R205,206
00SC2100D0	RES SMD 1206 10 Ohm 1/4W	3	R207..209
125DM01000	CONN DIR MA 1 PIN	32	TP1...32
06DASS1380	MOSFET BSS138	1	T1
063ABC8170	TRANSISTOR BC817 SMD	1	T2
06DASS1380	MOSFET BSS138	1	T3
063ABC8170	TRANSISTOR BC817 SMD	1	T4
06DASS1380	MOSFET BSS138	1	T5
063ABC8070	TRANSISTOR BC807 SMD	1	T6
063ABC8170	TRANSISTOR BC817 SMD	1	T7
06DBSP3180	MOSFET BSP318S SMD	1	T8
125DM01000	CONN DIR MA 1 PIN	3	U1
128DM01000	JUMPER 2 POLI	1	U1
125DM01000	CONN DIR MA 1 PIN	3	U2
128DM01000	JUMPER 2 POLI	1	U2
125DM01000	CONN DIR MA 1 PIN	2	U3
128DM01000	JUMPER 2 POLI	1	U3
125DM01000	CONN DIR MA 1 PIN	2	U4

	DESCRIPTION		CODE
	CONTROL BOARD ASS'Y		LP-910500031A
CODE	DESCRIPTION	Q.TY	REF.
128DM01000	JUMPER 2 POLI	1	U4
125DM01000	CONN DIR MA 1 PIN	2	U5
128DM01000	JUMPER 2 POLI	1	U5
125DM01000	CONN DIR MA 1 PIN	2	U6
128DM01000	JUMPER 2 POLI	1	U6
125DM01000	CONN DIR MA 1 PIN	2	U7
128DM01000	JUMPER 2 POLI	1	U7
125DM01000	CONN DIR MA 1 PIN	2	U8
128DM01000	JUMPER 2 POLI	1	U8
754510200B	CONTROL BOARD PCB	1	

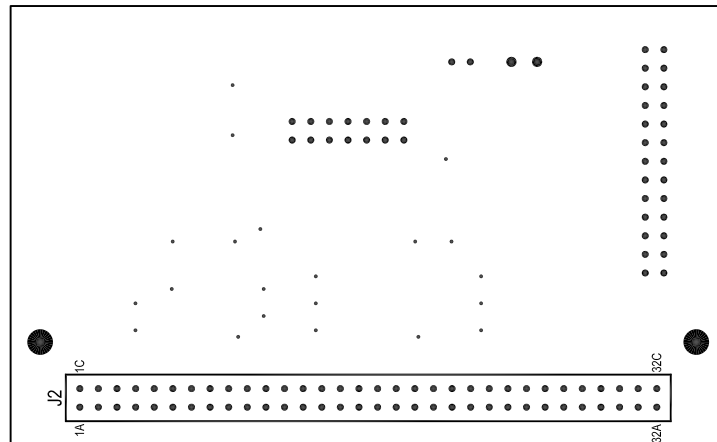
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Arch.			Dwg. INTECH								Date 26/11/12		TITLE DISPLAY INTERFACE		
			Chkd.												
								Scale		Tolerance		DWG. n. SE-910500046A			
												Format A4 Sheet 1 1			

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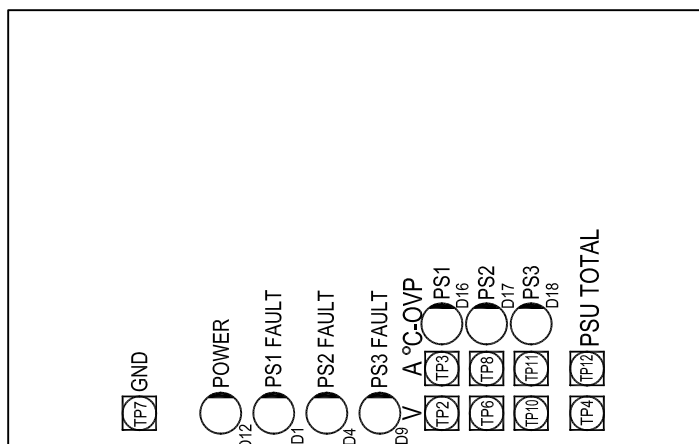
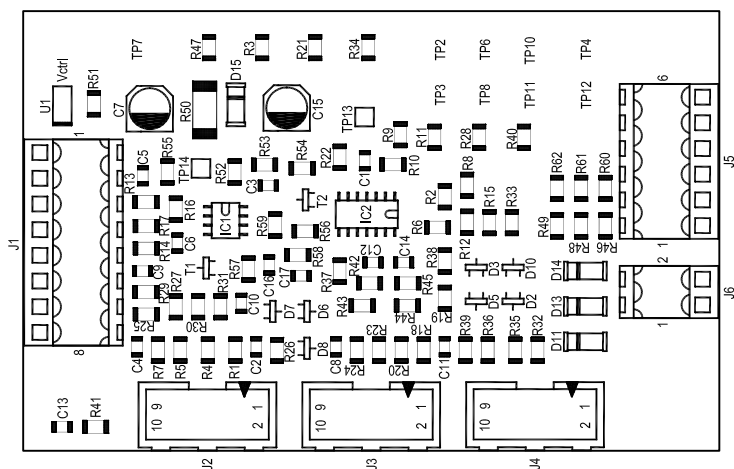


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Arch.			Dwg. INTECH								Date 26/11/12		TITLE DISPLAY INTERFACE			
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									Scale		Tolerance		DWG. n.		TP-910500046A	
													Format A4			Sheet 1 1

	DESCRIPTION		CODE
	DISPLAY INTERFACE		LP-910500046A
CODE	DESCRIPTION	Q.TY	REF.
0141605500	COND CER X7R 1uF 10% 25V 1206	1	C1
0147608400	COND CER X7R 100nF 10% 100V 0805	2	C2,C3
	IC HEF4050BT (NR.2)	2	IC1,IC2
0503040006	CONN DIN41651 2x13P MA CS	1	J1
0503020000	CONN PETTINE 2x40P MA CS	1	J2
0503040004	CONN DIN41651 2x7P MA CS	1	J3
	CONN 2P MA CS P3.5mm (NR.1)	1	J4
0003402308	RES F.SP. 22K 1% 1/4W 1206	12	R1,R3,R5,R7,R9,R11,R13,R15,R17,R19, R21,R23
0003402200	RES F.SP. 1K 1% 1/4W 1206	12	R2,R4,R6,R8,R10,R12,R14,R16,R18,R20, R22,R24
0503020000	CONN PETTINE 2x40P MA CS	0,3	U1
920000160A	C.S. DISPLAY INTERFACE	1	

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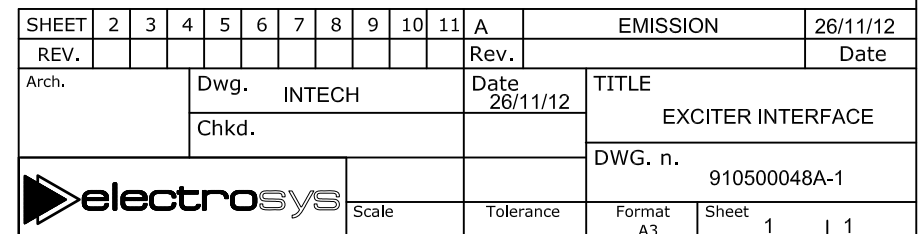
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REV.											Rev.				Date
Arch.				Dwg. INTECH							Date 26/11/12		TITLE POWER SUPPLY INTERFACE		
				Chkd.											
								Scale		Tolerance		DWG. n.		TP-910500047A	
												Format A4			

	DESCRIPTION		CODE
	PWR SUPPLY INTERFACE		LP-910500047B
CODE	DESCRIPTION	Q.TY	REF.
0147608400	COND CER X7R 100nF 10% 100V 0805	15	C1,C2,C3,C4,C5,C6,C8,C9,C10,C11,C12, C13,C14,C16,C17
0103106000	COND ALL 10uF 20% 35V 105° SMD5.3x5.3xH5.5	1	C7,C15
1100000000	LED ROSSO D:3mm	6	D1,D4,D9,D16,D17,D18
0600100000	DIODO 75V 200mA SOT23 BAS16	7	D2,D3,D5,D6,D7,D8,D10
0607100001	DIODO RETTIF SM4007 1000V 1A DO213AB	3	D11,D13,D14
1100000001	LED VERDE D:3mm	1	D12
0603100012	DIODO ZENER 12V 1W SMD DO213AB	1	D15
0800100001	C.I. 2 OP AMP LM358 SO8	1	IC1
0800100004	C.I. QUAD OP AMP LM324 SO14	1	IC2
0503130006	CONN 8P MA CS P3.5mm	1	J1
0503040000	CONN DIN41651 2x5P MA CS	3	J2,J2,J4
0503130014	CONN 6P MA CS P3.5mm	1	J5
	CONN 2P MA CS P3.5mm (NR.1)	1	J6
0002402000	RES S.M. 10R 1% 1/4W	6	R1,R18,R26,R29,R32,R54
0002402316	RES S.M. 47K 1% 1/4W	8	R2,R19,R25,R33,R51,R53,R56,R58
0002402208	RES S.M. 2K2 1% 1/4W	4	R3,R9,R21,R34
0002402300	RES S.M. 10K 1% 1/4W	12	R4,R10,R16,R20,R27,R35,R45,R52,R59, R60,R61,R62
0002402116	RES S.M. 470R 1% 1/4W	6	R5,R7,R23,R24,R36,R39
0002402500	RES S.M. 1M 1% 1/4W	5	R6,R17,R22,R37,R44
0002402308	RES S.M. 22K 1% 1/4W	4	R8,R12,R15,R38
0002402204	RES S.M. 1K5 1% 1/4W	4	R11,R28,R40,R42
0002402008	RES S.M. 22R 1% 1/4W	2	R13,R41
0002402508	RES S.M. 2M2 1% 1/4W	1	R14
0002402400	RES S.M. 100K 1% 1/4W	2	R30,R31
0003402310	RES F.SP. 27K 1% 1/4W 1206	1	R43
0002402700	RES S.M. 1R 1% 1/4W	3	R46,R48,R49
0002402212	RES S.M. 3K3 1% 1/4W	2	R47,R57
0003604100	RES F.SP. 100R 5% 1W 2512	1	R50
0003402302	RES F.SP. 12K 1% 1/4W 1206	1	R55
0703100001	MOSFET N 50V 200mA SOT23 BSS138	2	T1,T2
0503020001	CONN PETTINE 1x40P MA CS	1	U1
920000164A	C.S. PWR SUPPLY INTERFACE	1	

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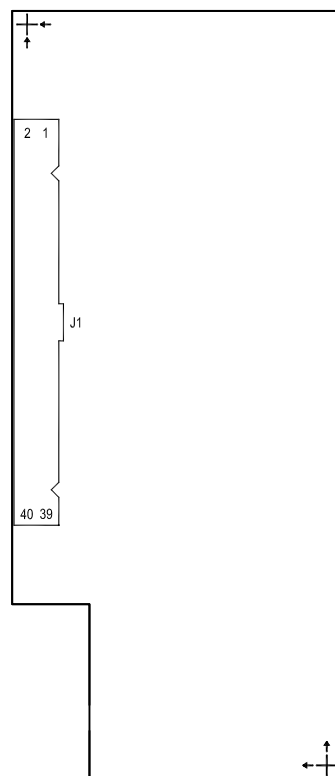
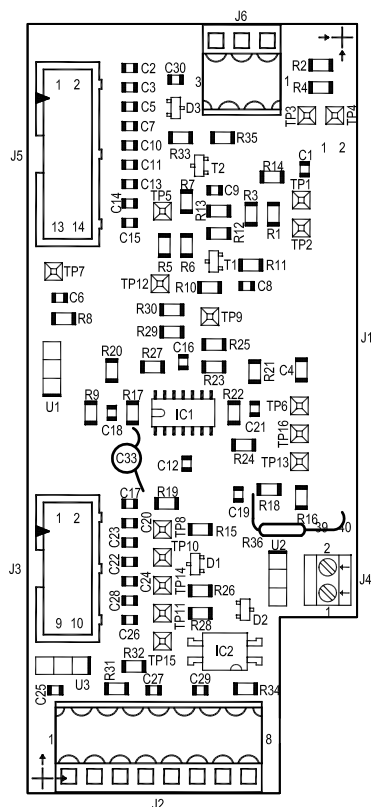


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TOP

BOTTOM



SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION		26/11/12	
REV.											Rev.			Date	
Arch.			Dwg. INTECH								Date 26/11/12		TITLE EXCITER INTERFACE		
			Chkd.												
													DWG. n.		910500048A-1
Scale									Tolerance		Format A4		Sheet 1 1		

	DESCRIPTION		CODE
	EXCITER INTERFACE		LP-910500048A
	DESCRIPTION	Q.TY	REF.
0147508200	COND CER NPO 1nF 5% 100V 0805	10	C1,C7,C8,C9,C10,C11,C14,C19,C24,C28
0147608400	COND CER X7R 100nF 10% 100V 0805	19	C2,C3,C5,C6,C12,C13,C15,C16,C17,C18, C20,C21,C22, C23,C25,C26,C27,C29,C30
0141605500	COND CER X7R 1uF 10% 25V 1206	1	C4
0147608300	COND CER X7R 10nF 10% 100V 0805	2	C31,C32
0130508108	COND CER NPO 220pF 5% 100V P.5.08	1	C33
0600100000	DIODO 75V 200mA SOT23 BAS16	1	D1
0603000003	DIODO ZENER 4.7V 1.3W	2	D2,D3
0800100004	C.I. QUAD OP AMP LM324 SO14	1	IC1
0803100016	C.I. OPTOCOUPLER SMD SFH6156-3	1	IC2
1320100001	SENS TEMP -25+125° LIN +6.25mV/° LM60B SOT23	1	IC3
0503040007	CONN DIN41651 2x20P FE CS	1	J1
0503130013	CONN 8P MA CS P3.5mm ANG	1	J2
0503040000	CONN DIN41651 2x5P MA CS	1	J3
0503120001	MORS 3P C.S. A VITE AWG14/22 P=3.5mm	1	J4
0503040004	CONN DIN41651 2x7P MA CS	1	J5
0503130016	CONN 3P MA CS P3.5mm ANG	1	J6
920000163A	C.S. EXCITER INTERFACE	1	PCB1
0003402120	RES F.SP. 680R 1% 1/4W 1206	2	R1,R4
0003402104	RES F.SP. 150R 1% 1/4W 1206	1	R28
0003402200	RES F.SP. 1K 1% 1/4W 1206	2	R17,R34
0003402108	RES F.SP. 220R 1% 1/4W 1206	3	R5,R24,R26
0003402106	RES F.SP. 180R 1% 1/4W 1206	1	R6
0003402118	RES F.SP. 560R 1% 1/4W 1206	1	R7
0003402300	RES F.SP. 10K 1% 1/4W 1206	13	R2,R3,R8,R10,R11,R12,R13,R15, R18,R19,R21,R31,R32,R33
0003402016	RES F.SP. 47R 1% 1/4W 1206	1	R9
0003402100	RES F.SP. 100R 1% 1/4W 1206	1	R14
0003402400	RES F.SP. 100K 1% 1/4W 1206	1	R16
0003402312	RES F.SP. 33K 1% 1/4W 1206	1	R22
0003402500	RES F.SP. 1M 1% 1/4W 1206	2	R23,R27
	RES F.SP. 8K2 1% 1/4W 1206	1	R25
0003402208	RES F.SP. 2K2 1% 1/4W 1206	1	R29
0003402216	RES F.SP. 4K7 1% 1/4W 1206	1	R30
	RES F.SP. 3K3 1% 1/4W 1206	1	R35
0002402408	RES S.M. 220K 1% 1/4W	1	R36
0003402714	RES F.SP. 3K9 1% 1/4W 1206	1	R20
	TEST POINT (PZ. 16)	16	TP1,TP2,TP3,TP4,TP5,TP6,TP7,TP8,TP9, TP10,TP11,TP12,TP13,TP14,TP
0703100001	MOSFET N 50V 200mA SOT23 BSS138	2	T1,T2
0503020001	CONN PETTINE 3P MA CS	3	U1,U2,U3
0590000011	JUMPER P2.54mm	3	JP1,JP2,JP3

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	DESCRIPTION		CODE
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CODE	DESCRIPTION	Q.TY	REF.
0003402000	RES F.SP. 10R 1% 1/4W 1206	2	R1,R2
0141616300	COND CER X7R 10nF 10% 500V 1206	3	C1,C2,C3
0503040000	CONN DIN41651 2x5P MA CS	1	J1
0503120001	MORS 2P C.S. A VITE AWG14/22 P=3.5mm	1	J2
0503020008	CONN PETTINE 2x5P FE H=7mm TULIPANO	1	J3
0503020009	CONN PETTINE 2x10P FE H=7mm TULIPANO	1	J4
0503020001	CONN PETTINE 2P MA CS	1	J5
0590000011	JUMPER P2.54mm	1	J5
920000183A	C.S. INTERFACCIA CTRL BOARD FM	1	1

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NOTA:

VERSIONE AMP 910500050B

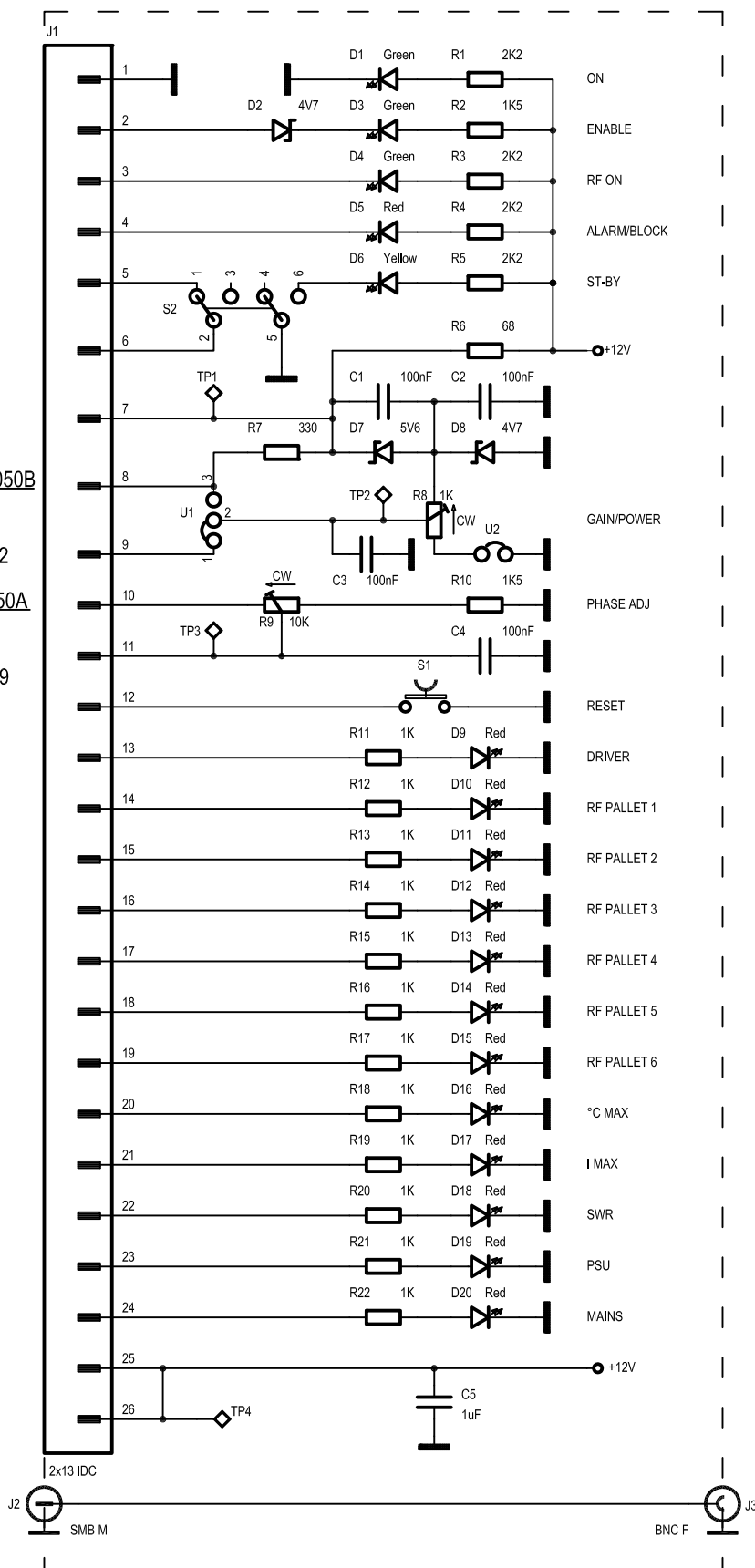
MONTARE R8-R9

NON MONTARE D6-S2

VERSIONE TX 910500050A

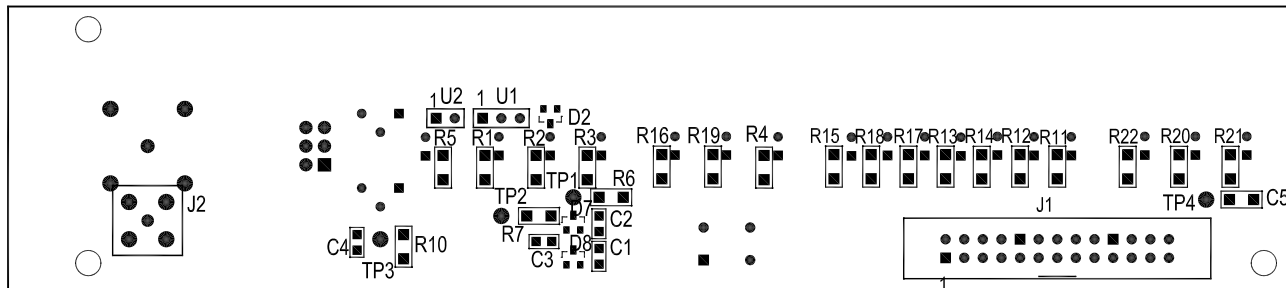
MONTARE D6-S2

NON MONTARE R8-R9

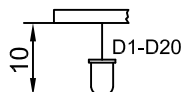
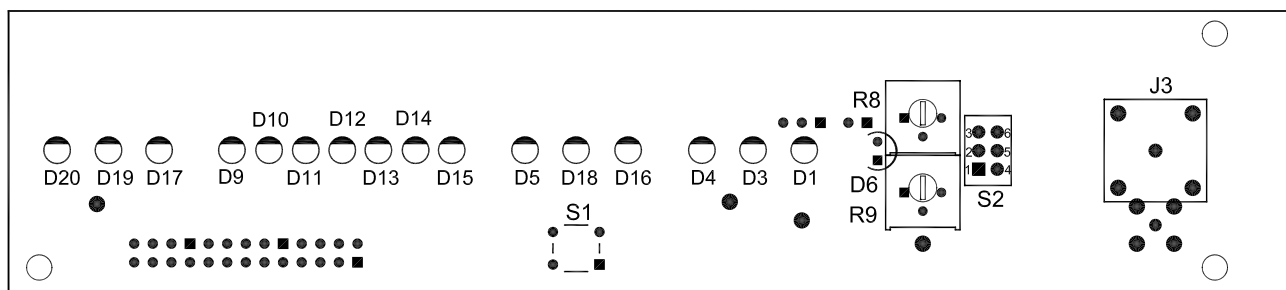


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COMPONENTS SIDE



SOLDER SIDE



NOTA:

VERSIONE AMP 910500050B

MONTARE R8-R9

NON MONTARE D6-S2

VERSIONE TX 910500050A

MONTARE D6-S2

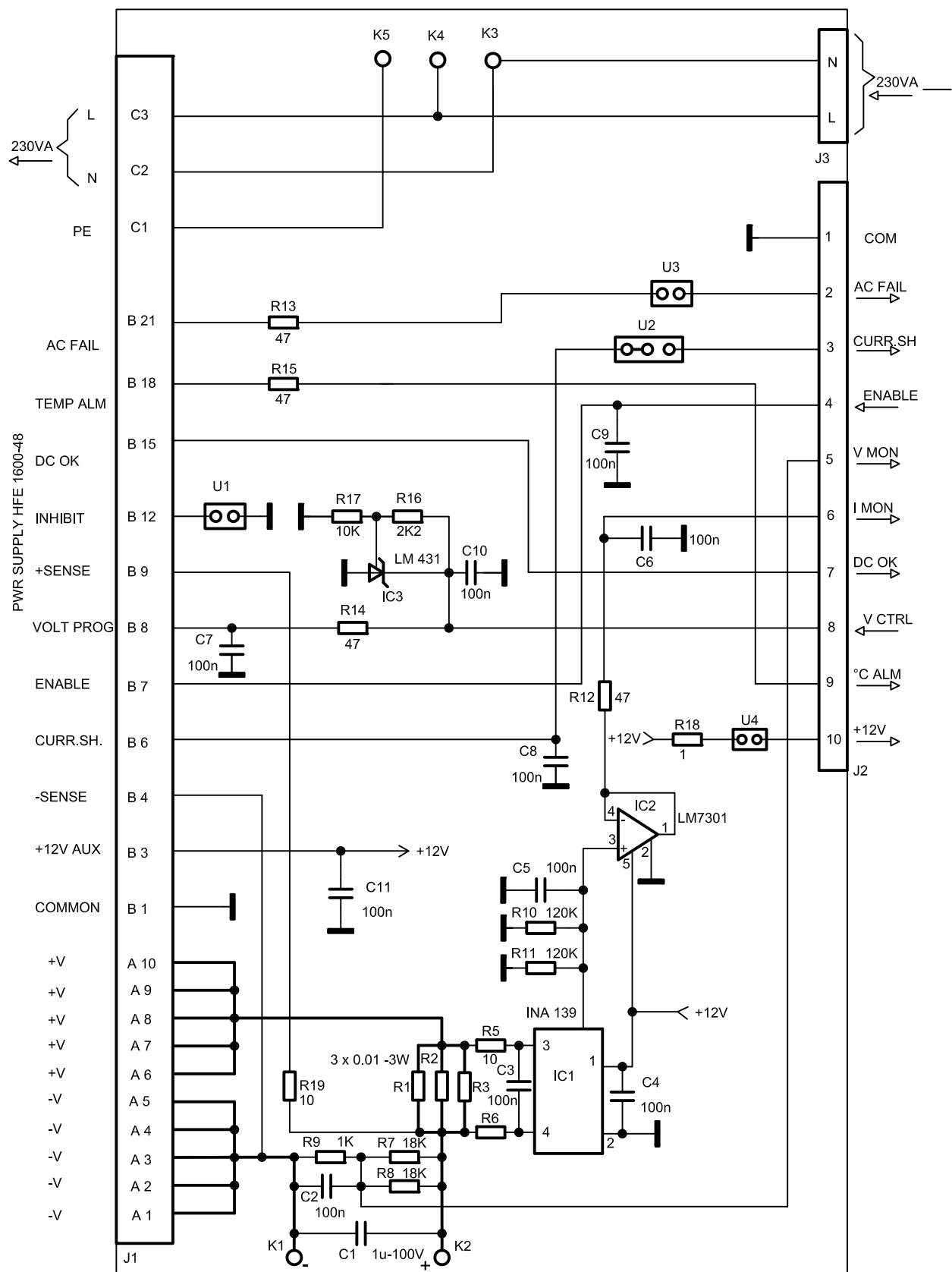
NON MONTARE R8-R9

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Arch.				Dwg. INTECH							Date 26/11/12		TITLE DISPLAY BOARD TX/AMP 2U	
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									Format A4		Sheet 1		1	

	DESCRIPTION		CODE
	DISPLAY BOARD		LP-910500050A
CODE	DESCRIPTION	Q.TY	REF.
0147608400	COND CER X7R 100nF 10% 100V 0805	4	C1,C2,C3,C4
0141605500	COND CER X7R 1uF 10% 25V 1206	1	C5
1100000001	LED VERDE D:3mm	3	D1,D3,D4
0603100000	DIODO ZENER 4.7V 1/4W SOT23	2	D2,D8
1100000000	LED ROSSO D:3mm	13	D5,D9,D10,D11,D12,D13,D14,D15,D16 D17,D18,D19,D20
0603100005	DIODO ZENER 5.1V 1/4W SOT23	1	D7
0503040006	CONN DIN41651 2x13P MA CS	1	J1
0523000000	CONN SMB MA CS	1	J2
0523020000	CONN BNC FE 50R C.S. P.6.25mm	1	J3
0003402208	RES F.SP. 2K2 1% 1/4W 1206	4	R1,R3,R4,R5
0003402204	RES F.SP. 1K5 1% 1/4W 1206	2	R2,R10
0003402020	RES F.SP. 68R 1% 1/4W 1206	1	R6
0003402112	RES F.SP. 330R 1% 1/4W 1206	1	R7
0030073200	RES VAR MONO R VERT 1K 10% 1/2W CS	1	R8
0030073300	RES VAR MONO R VERT 10K 10% 1/2W CS	1	R9
0003402200	RES F.SP. 1K 1% 1/4W 1206	12	R11,R12,R13,R14,R15,R16,R17,R18, R19,R20,R21,R22
0404000000	INT MICRO 1P TEMP CS 6x6 L=8mm	1	S1
0503020001	CONN PETTINE 3P MA CS	1	U1
0503020001	CONN PETTINE 2P MA CS	1	U2
920000179A	C.S. DISPLAY BOARD	1	

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SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION		26/11/12		
REV.											Rev.			Date		
Arch.				Dwg. INTECH							Date	TITLE P.S. INTERFACE L 1.6				
				Chkd.							26/11/12					
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													Format A4			
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electrosys

Scale

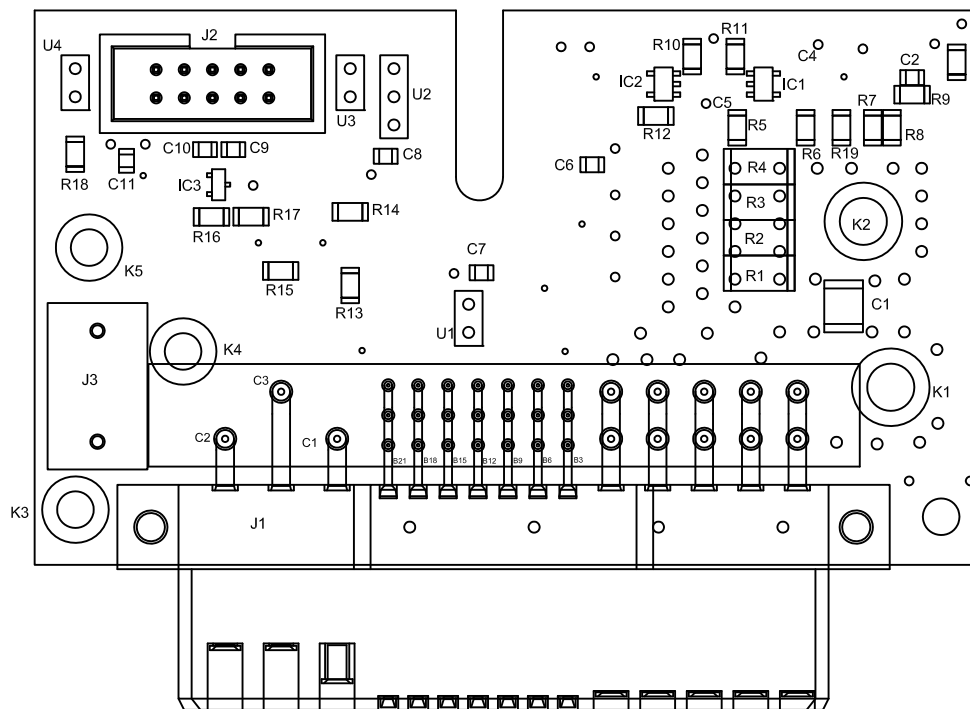
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Format

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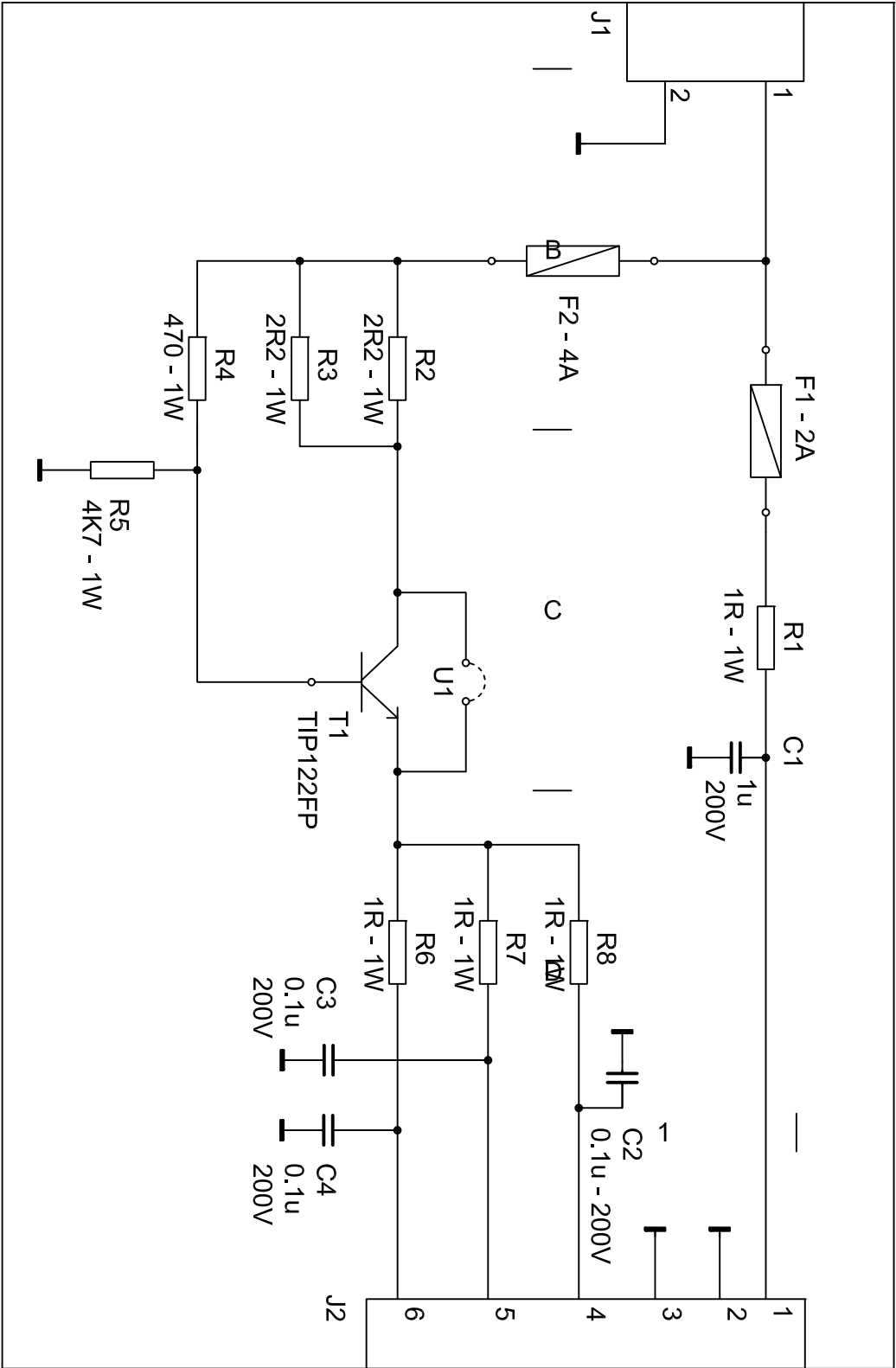
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Arch.				Dwg. INTECH							Date 26/11/12		TITLE P.S. INTERFACE L 1.6	
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													Sheet 1 1	

DESCRIPTION		CODE	
P. S. INTERFACE L 1.6		LP-910500056A	
CODE	DESCRIPTION	Q.TY	REF.
0141608500	COND CER X7R 1uF 10% 100V 1812	1	C 1
0147608400	COND CER X7R 100nF 10% 100V 0805	10	C 2...C 11
0803100015	C.I. SOT23-5 INA139	1	IC 1
0800100005	C.I. OP AMP LM7301 SOT23 5PIN	1	IC 2
0802100007	C.I. S SOT23 LM431BCM3	1	IC 3
	CONN.F PCIM34W13F400A/AA	1	J 1
0503040000	CONN DIN41651 2x5P MA CS	1	J 2
		2	K 1, 2
		3	K 3...5
0003405900	RES F.SP. 0R01 1% 3W SMD 2512	3	R 1...3
0003402000	RES F.SP. 10R 1% 1/4W 1206	3	R 5, 6
	RES F.SP. 18K 1% 1/4W 1206	2	R 7,8
0003402200	RES F.SP. 1K 1% 1/4W 1206	1	R 9
	RES F.SP. 120K 1% 1/4W 1206	2	R10,11
0003402016	RES F.SP. 47R 1% 1/4W 1206	2	R12,14
0003402016	RES F.SP. 47R 1% 1/4W 1206	0	R13,15
0003402208	RES F.SP. 2K2 1% 1/4W 1206	1	R16
0003402300	RES F.SP. 10K 1% 1/4W 1206	1	R 17
0003402700	RES F.SP. 1R 1% 1/4W 1206	0	R18
0003402000	RES F.SP. 10R 1% 1/4W 1206	1	R19
0503020001	CONN PETTINE 1x40P MA CS	0,15	U 1, 3, 4
0503020003	CONN PETTINE 1x40P MA CS	0,075	U 2
	CS PS INTERFACE L 1.6	1	



2

SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION		26/11/12
REV.											Rev.			Date
Arch.			Dwg. INTECH								Date	TITLE DC DISTRIBUTION / CONTROL FAN		
			Chkd.								26/11/12			
								Scale		Tolerance		DWG. n.		
												SE-910700016A		
												Format	Sheet	
A4		1		1										

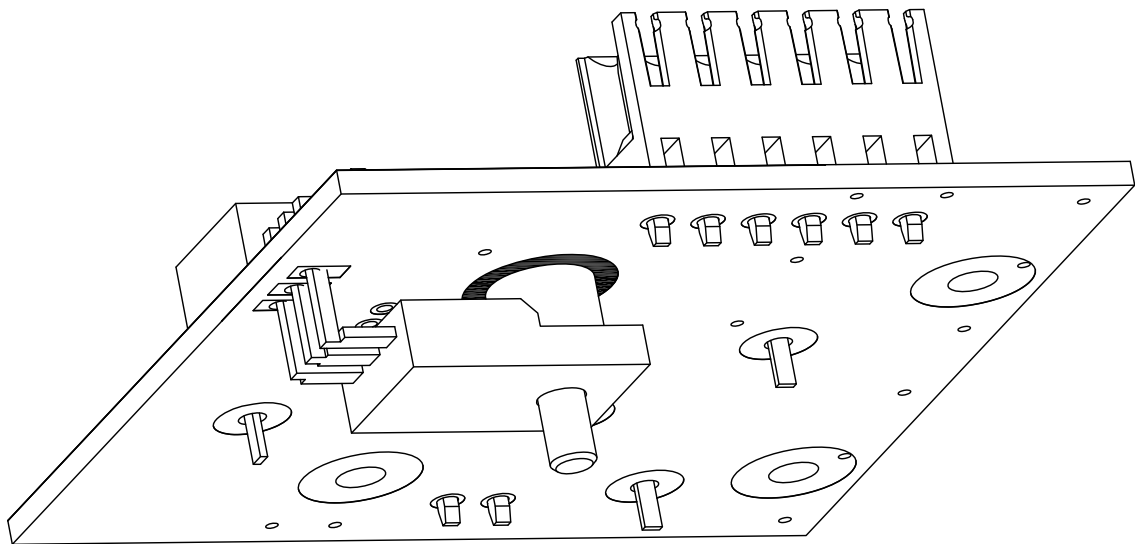
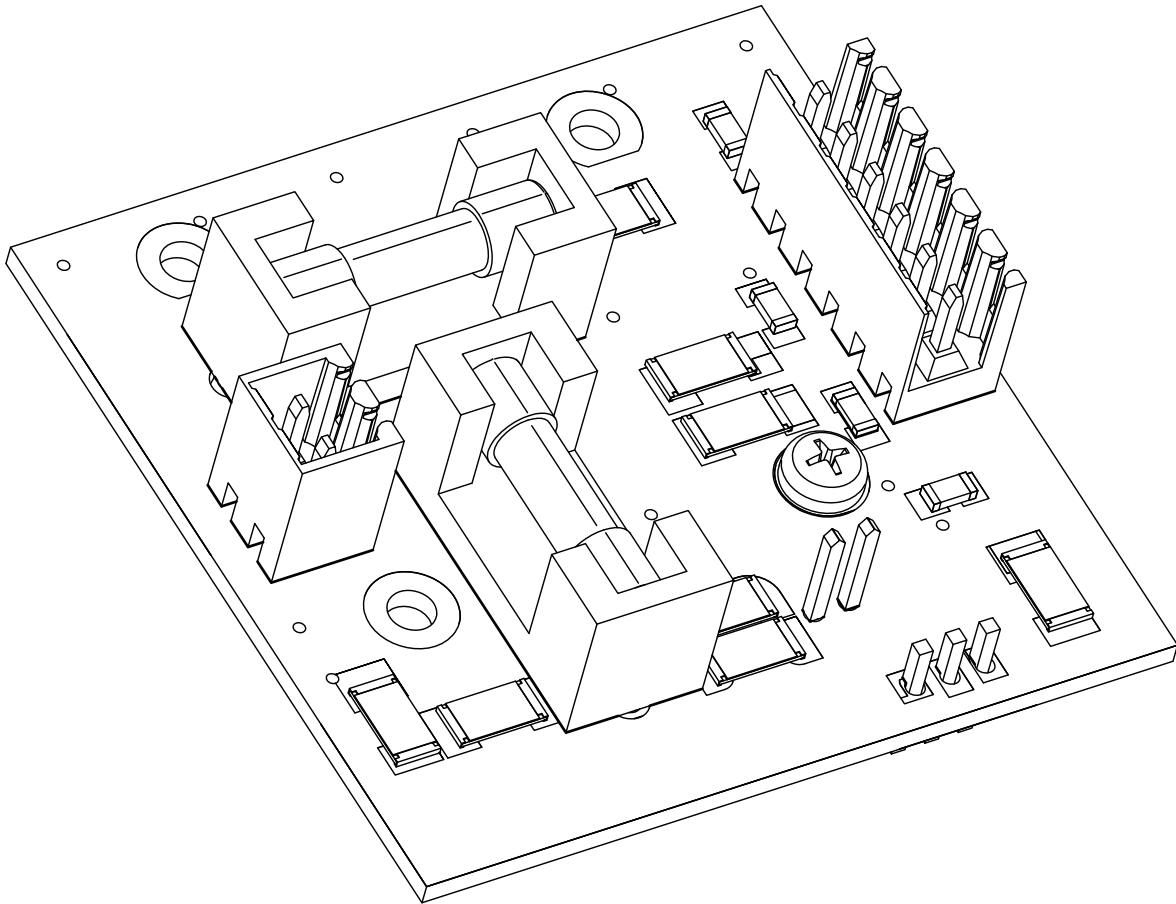
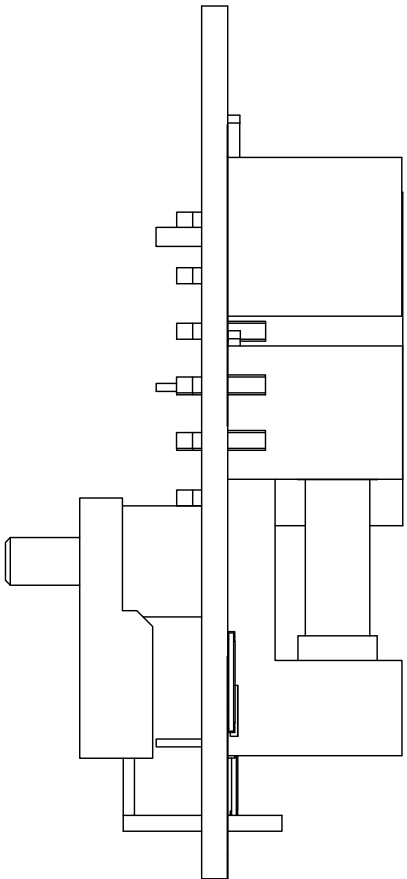
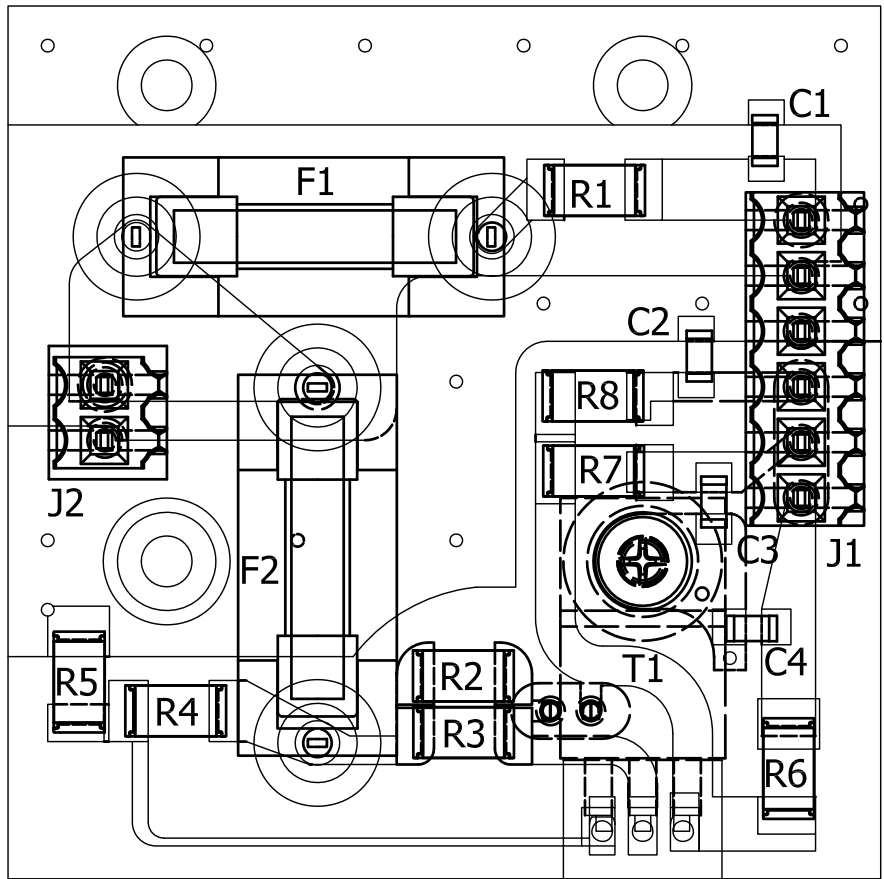
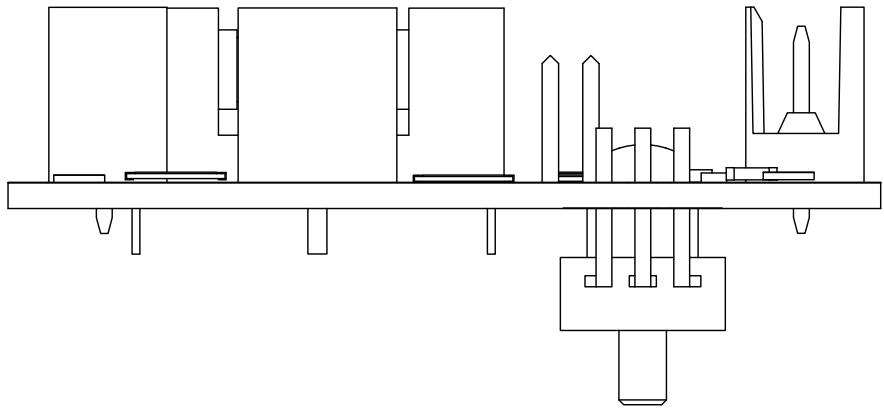


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SHEET	2	3	4	5	6	7	8	9	10	11	A	EMISSION				26/11/12				
REV.												Rev.					Date			
Arch.			Dwg.		INTECH						Date		TITLE DC DISTRIBUTION / CONTROL FAN							
			Chkd.		TITLE						26/11/12									
															DWG. n.					
															TP-910700016A					
												Scale			Tolerance			Format		Sheet
A3																				

DESCRIPTION		CODE	
DC/DISTRIBUTION/CONTROL FAN		LP-910700016A	
CODE	DESCRIPTION	Q.TY	REF.
0141610400	COND CER X7R 100nF 10% 200V 1206	4	C1,C2,C3,C4
0003604700	RES F.SP. 1R 5% 1W 2512	4	R1,R6,R7,R8
0003604708	RES F.SP. 2R2 5% 1W 2512	2	R2,R3
0003604116	RES F.SP. 470R 5% 1W 2512	1	R4
0003604216	RES F.SP. 4K7 5% 1W 2512	1	R5
0503130017	CONN 2P MA CS P3.5mm	1	J1
0503130014	CONN 6P MA CS P3.5mm	1	J2
0701200000	TRANS NPN 100V 5A TO220FP	1	T1
0461400002	FUS RIT 2A 250V 5x20mm	1	F1
0461400003	FUS RIT 3.15A 500V 6.3x32mm	1	F2
0552000001	PORTAFUS 5x20 C.S.	1	F1,F2
4070331050	DIST CIL d3.2xH5mm OTT NIC	1	2
920000185A	C.S. DC DISTR / CONTROL FAN	1	1