

# CONTROL AND MONITORING SYSTEMS

## Technical description

Control and monitoring system for TRedess DVB-T transmitters and gap fillers allows remote system management and remote alarm control. This solution is configurable according to customer needs and requirements and it is placed in a 19" subrack with 5HU and 250mm depth dimensions. Thanks to its modular configuration is possible to carry out system supervision through different interfaces and different protocols.



## System units are:



### Power supply units

Two power supply units working in redundancy are connected to the power distribution unit that informs about their status and distributes powers. These units are the same power supply units used with TRedess transmitters and gap fillers.

### Management module

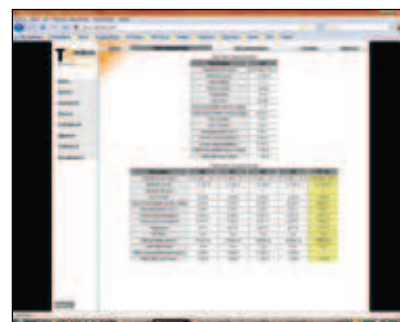
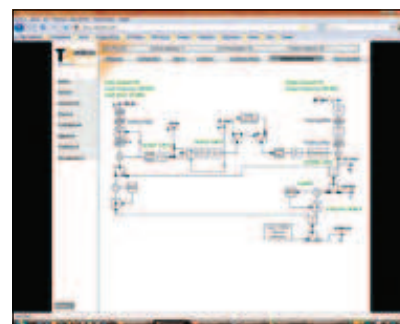
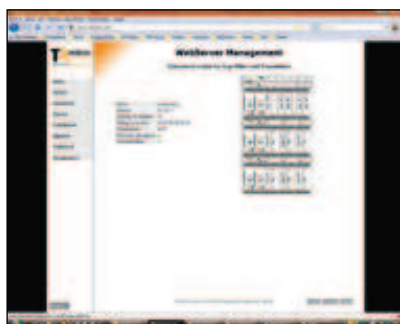
It centralises the different system alarms and events from every detected module making a periodic checking. The Management unit supplies, without any additional module, remote control and monitoring through Ethernet and serial communication (HTTP, SNMP, PPTP, IPsec, TCP-IP).

### GSM/GPRS modem

Connected to remote control module (Management) through a serial port allows system communication through mobile networks.

### Alarms

Allows exporting system alarms using electrical relays, receiving remote control commands for external equipments through optical couplers and acting over external equipments using electrical relays. Furthermore, the contacts module could be supplied with the GSM/GPRS modem module.



**DVB-T receiver**

It analyses DVB-T transmitted signals and informs to control module (Management) about their quality.

**GPS module (only for transmitters)**

For transmitters we supply a GPS synchronization system that works in redundancy. Synchronization signals (10MHz and 1pps) from each GPS module are distributed and switched through the GPS switching unit.

**Power distribution and GPS switching unit**

It informs about power supply units' status to monitoring system. It also manages synchronization signal received from the GPS modules, selecting locked one. It includes the needed circuits for eight 10MHz and 1pps signals generation (all of them available through BNC connectors placed on the back side of the module).

# TREDESS

## WEBSERVER MANAGEMENT

TRedess equipments can be managed and controlled (local or remotely) with our **WebServer Management** application tool. Through an IP connection it is possible to configure and control the system (modules, alarms, ...) and configure all the transmission parameters (IP settings, GSM/GPRS parameters, VPN, serial port).

Using its friendly graphical interface it is possible to obtain all parameters details and internal diagrams, alarm log, module status, etc, and modify and upgrade all the system.

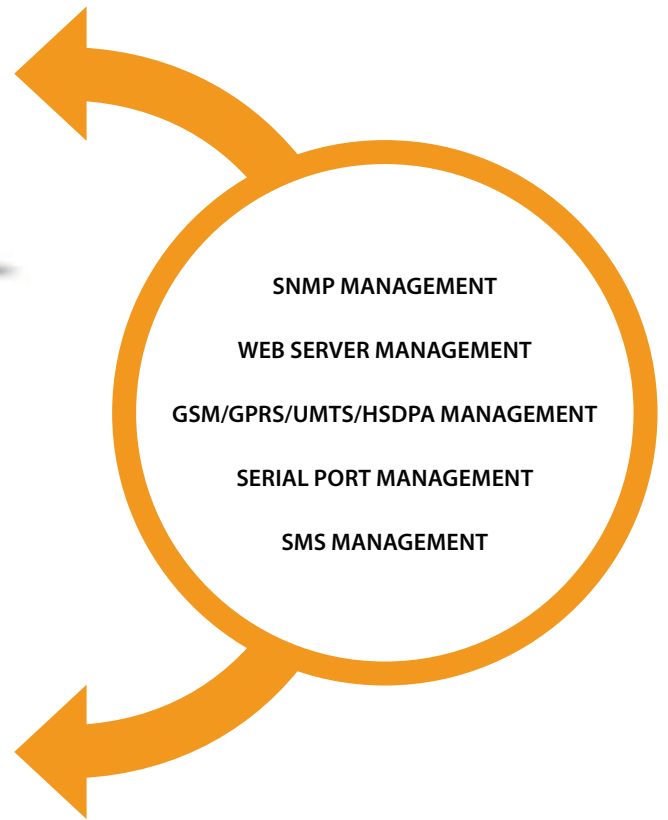


### CONTROL AND MONITORING SYSTEMS | REFERENCES AND SPECIFICATIONS

References	856001	856002	856003	856004	856005	856006	856007	856008	856009	856010	856011	
Denomination	STG FA-MNG	STG FA-NG-GSM	STG FA-GPS	STG FA-2GPS	STG FA-MNG-GPS	STG FA-MNG-GSM-GPS	STG FA-MNG GSM-DEMOM-2GPS	STG FA-MNG-GSM-DEMOM	STG FA-MNG-CON	STG FA-MNG-GSM-DEMOM-2GPS-CON	STG FA-MNG-DEMOM-2GPS	
<b>Composition</b>												
Remote control system	1	1	1	1	1	1	1	1	1	1	1	
FA - Power Supply	1	1	1	1	1	1	1	1	1	1	1	
FAVF - Power supply with forced ventilation	0	0	0	0	0	0	0	0	0	0	0	
MNG - Management module	1	1	0	0	1	1	1	1	1	1	1	
GSM - GSM/GPRS module	0	1	0	0	0	1	1	1	0	1	0	
GPS - GPS module	0	0	1	2	1	1	2	0	0	2	2	
DEMOM - DVB-T Demodulator module	0	0	0	0	0	0	1	1	0	1	1	
CON - Alarms module	0	0	0	0	0	0	0	0	1	1	0	
Redundant Power Supply	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	



EXTERNAL ALARM MONITORING  
AND EQUIPMENT CONTROL



	856012	856013	856014	856015	856016	856017	856018	856019	856020	856021	856022	856023	856024
	STG FA-MNG- DEMOD- 2GPS-CON	STG 2FAVF- MNG	STG 2FAVF- MNG-GSM	STG 2FAVF- GPS	STG 2FAVF- 2GPS	STG 2FAVF- MNG-GPS	STG 2FAVF- MNG-GSM- GPS	STG 2FAVF- MNG-GSM- DEMOD- 2GPS	STG 2FAVF- MNG-GSM- DEMOD	STG 2FAVF- MNG-CON	STG 2FAVF- MNG-GSM- DEM-2GPS- CON	STG 2FAVF- MNG-DE- MOD-2GPS	STG 2FAVF-MNG- DEMOD- 2GPS-CON
	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	2	2	2	2	2	2	2	2	2	2	2	2
	1	1	1	0	0	1	1	1	1	1	1	1	1
	0	0	1	0	0	0	1	1	1	0	1	0	0
	2	0	0	1	2	1	1	2	0	0	2	2	2
	1	0	0	0	0	0	0	1	1	0	1	1	1
	1	0	0	0	0	0	0	0	0	1	1	0	1
	Optional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



### MANAGEMENT module | SPECIFICATIONS

Hardware settings	
Processor and memory	CPU ATMEL AT91RM9200 with MMU clock 180 MHz SDRAM 64MB (20MB user space) NOR Flash of 8MB (7MB user space) NAND Flash of 128MB
Network	Ethernet 10/100 Mbps
USB	USB 2.0 compatible
UARTS	Signal level CMOS/3'3V <b>Functionality:</b> Port1: RS232 external (modem) Port2: Local programmer Port3: RS485 (control bus)
Timer	Watchdog included in CPU, used for Linux kernel
Power	<b>Consumption:</b> 13'5V: 140mA 5V: 15mA <b>Power consumption:</b> 2W
Software settings	
OS	Linux kernel 2.6.16
File system	JFFS2, EXT2/3, VFAT/FAT, NFS support
Protocol stack	IPv4/IPv6, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, HTTP, XML, SNMP v1/v3, SSL, SSH1/2 support
Utils	Bash: Shell commands Telnet: Client program BusyBox: UNIX utilities
Daemons	snmpd: SNMP agent boa: Web server sshd: secure shell server iptables: firewall control
Drivers	SD/MMC, UART, Ethernet, GPIO, Real Time Clock, EEPROM, RS-232-RJ45 adapter, GSM/GPRS modem (TriskRem)

### GSM/GPRS MODEM module | SPECIFICATIONS

Modem	
Frequency bands	EGSM 850/900/1800/1900MHz
Output power	2W @ 850/900MHz 1W @ 1800/1900MHz
Sensitivity	-107dBm @ 850/900MHz -106dBm @ 1800/1900MHz
Temperature range	-30 to 80°C
Consumption	26µA (power off) < 4mA (power save) 200mA (direct mode) 370mA (max consumption mGPRS)
Antenna	
Impedance	50Ω
Gain	0dBi
Radiation diagram	Omnidirectional
Polarization	Vertical
VSWR	<2



## DVB-T RECEIVER module | SPECIFICATIONS

Technical settings	
<b>DVB-T DE-MODULATOR</b>	
Inputs	2
Connector	BNC female
Input frequency	174-230 / 474-858MHz
Frequency steps	1MHz
Lock margin	±500KHz
Input C/N (64QAM, 2/3, 1/4)	20dB
FFT	2K, 8K
Modulation	QPSK, 16QAM, 64QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Input level	49 to 89dBμV (-60 to -20dBm) (8K, 64QAM, FEC 2/3)
Viterbi rate	1/2, 2/3, 3/4, 5/6, 7/8
Symbol rate	31'67Msymbol/sec
Standard	ETS300744
<b>MPEG-2 decoder</b>	
Input format	TS MPEG-2/DVB
Decoding	MP@ML
Input rate	60Mbps max
Video rate	1'5 to 15Mbps
Video resolution	720x576 max
<b>POWER</b>	
Consumption	13'5V: 200mA 5V: 325mA
Power consumption	4'5W

## ALARM module | SPECIFICATIONS

Optocoupler inputs	
External alarm inputs	15 (12 in ALARMS2 connector and 3 in ALARMS1 connector)
Input-Output isolation	5000V
Response	5μs
Consumption (per active input)	50mW
<b>Outputs</b>	
Outputs	21 (9 in ALARMS1 connector)
Impedance	75mΩ
Max power	60W
Max voltage	220Vdc, 125 Vac
Max current	2A
Expected life	108 switchings
Consumption (per relay)	70mW



### GPS module | SPECIFICATIONS

Synchronization output in frequency (10 MHz)	
Precision	$<\pm 2 \times 10^{-12}$ (24 hours with GPS locked)
Stability	$<\pm 3 \times 10^{-10}$ (without GPS, constant temperature and after 2 working weeks)
Short time stability (Allan variance)	@ 10ms $5 \times 10^{-11}$ @ 100ms $1 \times 10^{-11}$ @ 10s $3 \times 10^{-11}$
Thermal stability	$1 \times 10^{-9}$ (peak, from 0°C to 60°C)
Phase noise	10Hz -120dBc/Hz 100Hz -130dBc/Hz 1KHz -140dBc/Hz 10KHz -145dBc
Type of signal	Sine
Level	5dBm / 50Ω
Harmonic distortion	-40dBc
Synchronization output in time (1 pps)	
Precision (with GPS locked)	$\pm 100$ ns
HOLDOVER	
After 4 hours	0'8μs
After one day (constant temperature)	12μs
Signal and level	1 pps TTL / 50Ω
Power Supply	
Consumption (25°C)	5V / 500mA, 13'5V / 300mA
Consumo (durante el calentamiento)	5V / 500mA, 13'5V / 500mA
Temperature range	-5 to 60°C
Connectors	BNC female
Antenna	
Frequency range	1575'42 ± 1'023MHz
Polarization	Right circular
Gain	38dBi
Attenuation	@ 1575'42 ± 1'023MHz
Figure of noise	< 2'2dB
VSWR	< 2
Power Supply	5V / 20mA
Temperature range	-40 to 85°C
Connector	Female N



### Power distribution and GPS switching unit | SPECIFICATIONS

Technical settings	
10MHz inputs (redundant)	2
10MHz input connector	BNC female
1PPS inputs (redundant)	2
1PPS input connector	BNC female
10MHz outputs	8
10MHz output connector	BNC female
1PPS outputs	8
1PPS output connector	BNC female

Impedance	50Ω
Insertion loss (10MHz)	<5dB
Power supply (2 redundant inputs)	13'5V / 5V
Battery	Litium
Power supply connector	5 links
Temperature range	0 to 45°C
Dimensions	482x43x90mm
Weight	1'5Kg