IRIS BOX TRS

EMBEDDED INDUSTRIAL
4AI / 4DI / 4DO

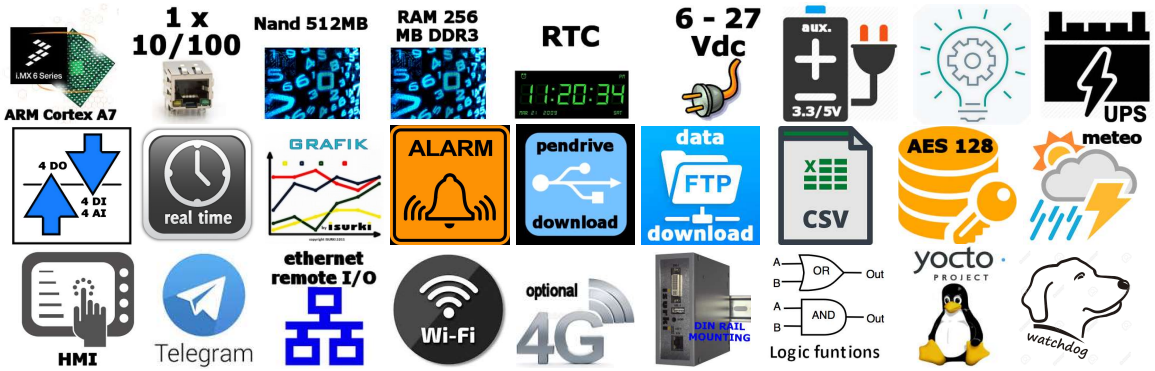
OPEN INTERNET ACCESS
VIA 4G ROUTER

FULL REMOTE CONTROL
VIA TELEGRAM

3 ENERGY
SAVING MODES

DETACHABLE
CONNECTORS

PEER TO PEER TO ANY
SMART TERMINAL



✉ Gabiria 2, 1-L E-20.305 Irun SPAIN ☎(34)943-635437 Fax(34)943-635438
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IRIS BOX TRS [1] is a state of the art cutting edge ARM based industrial Telecontrol Remote Server and IIoT gateway, developed by **ISURKI** as the result of more than 25 years of expertise in the design and deployment of industrial telecontrol systems for the management of facilities, services and environmental control networks. **IRIS BOX TRS** offers the maximum reliability, flexibility and performances, thus offering the most advanced telecontrol technology.

Its core is a Toradex® system on module based on two different optional NXP processors: the Vybrid VF61 and the iMX.6.

The embedded industrial grade input / output **TESDA** board directly interfaces the unit with harsh industrial environments, such as field sensors and detectors, actuators, valves, drives, ...

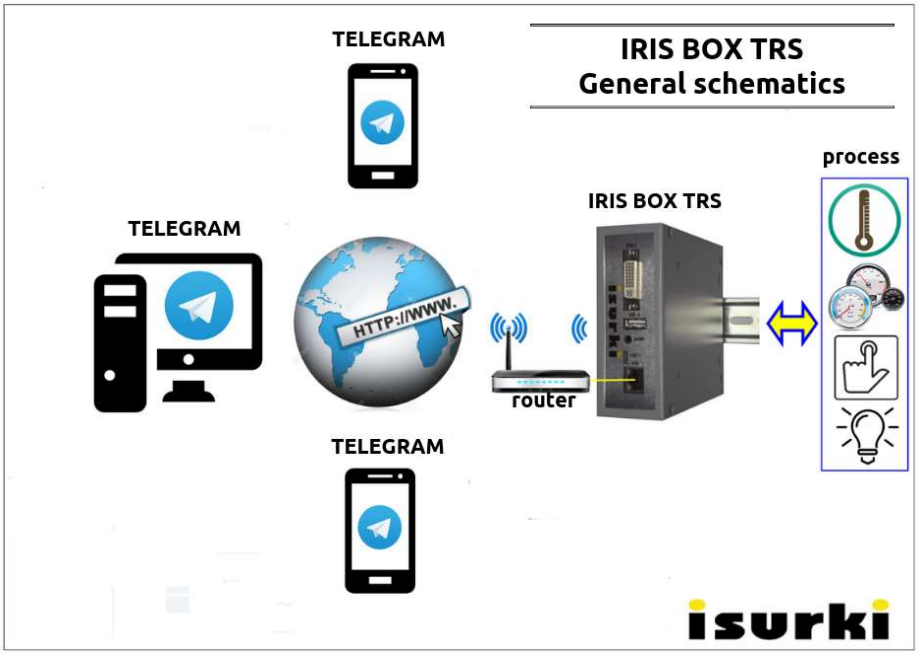
IRIS BOX TRS is part of the **ISURKI**'s **IRIS IIoT** ecosystem which includes the **IRIS SAP** nodes, a family of standalone Sensor Access Points and Sensor Packs for the deployment of Wireless Sensor Networks (WSN). Thus, the user can deploy spatially distributed autonomous **IRIS SAP** nodes using sensors to monitor physical or environmental conditions, states and parameters.

The most important **IRIS BOX TRS** advantage lies in its modularity, allowing the users to adapt the final scope, features and composition of the unit to their application requirements, through the selection of the hardware and software modules necessary to fit the project specifications. The user's configured final scope housing is based in an All In One concept and a Plug & Play execution.

Also, its stand alone "peer to peer" concept design allows the user to directly interface to the unit from any internet connected smart device, with no intermediate servers involved.

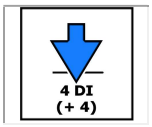
Therefore, **IRIS BOX TRS** is a tailored on the shelf product, with the open possibility of enhancing its features fitting future requirements, just adding the required hardware and software supplementary modules.

Besides, the design, development and after sales support services offered by **ISURKI** warranty the implementation of specific automation, control and communications routines according to the project requirements, as well as their upgrading and maintenance.



IRIS BOX TRS based telecontrol system

[1] As a result of a constant evolution, here in stated characteristics can be upgraded and changed without previous notice to customer. Please ask the last data sheet version contacting directly with our company.

IRIS BOX TRS features		
Item	**Icon**	**Description**
	CPU	
CPU Type		Standard: ARM Cortex™-A7, 528 MHz Optional: Arm Cortex™-A9, 1.0 GHz
RAM		256MB DDR3L (16 Bit)
Flash		Standard: 512MB SLC NAND (8 Bit) Optional: 4 GB eMMC
RTC		On board Real Time Clock supported lithium 3V cells: BR1216, CR1216, BR1220, CL1220, CR1220, BR1225
	POWER SUPPLY	
DC supply		6 – 27 Vdc 5 watts maximum consumption Reverse polarity and short circuit protected Lumberg M8 industrial detachable embedded connector Includes 2 wire external cable 0.5 m. long
Energy saving		Factory default: continuous consumption mode (*Automatic*), < 5 watts *Suspended* energy saving mode: according to registration interval, active all the day long *Hybernated* energy saving mode: to registration interval, active only during daytime schedule, < 1.4w. User configurable
UPS		Industrial UPS Output: 40W, 13'8 Vdc (12 to 15V adjustable), 1'9 A (CH1) and 1A (CH2), current range 0-2.9A Input: 90 – 264Vac, 47 – 63 Hz, efficiency 86%, 0.6A @ 230 Vac Open collector outputs: *AC OK* and *Battery Low*. Overload protection:105-150% of rated output power Overvoltage protection CH1: 14.49 – 18.63 V Battery cut off protection: 10 ±0.5V
Surge arrestor		2 optional overvoltage protection degrees depending of selected surge arrestor: • for up to 30 Vdc power supply input to the TRS, 20 kA discharge capacity. • for up to 230 Vac power supply input to the TRS, 15 kA discharge capacity. • Vac option includes one led & one NC contact for fault indication as well as DIN mounting.
	EMBEDDED INPUT & OUTPUTS	
Digital inputs		Factory default: 4, optocoupled(V_{ISO}=5300 V_{RMS}), dry contact / voltage Optionally, 4 additional inputs can be used instead of the digital outputs.

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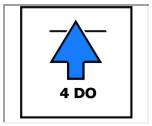
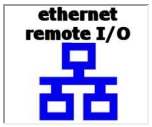
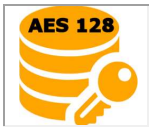
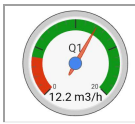
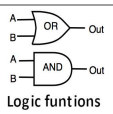
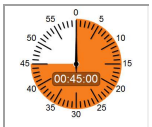
Analog inputs		4 x 4-20 mA optocoupled(V_{AIS}=1414 V_{RMS}) active/passive mode 12 bits resolution
Digital outputs		4 relays 1 SPDT contact 0'12A@250VAC, 4A@12Vdc
Auxiliary power supplies		18 Vdc (for DIs and AIs) 5 Vdc-3'5A 3'3 Vdc-2'5 A
DECENTRALIZED INPUT & OUTPUTS		
Remote I/O		Ethernet 10/100 Daisy Chain connected I/O DIN rail modules: • 4 DI / 4DIO / 4AI 16 bits / 2x10-100 Mbps RJ45 ETH (available) • 16 DI / 2x10-100 Mbps RJ45 ETH (TBD) • 8 DI / 8 DO / 2x10-100 Mbps RJ45 ETH (TBD)
DATA LOGGING AND SECURITY		
Format		Monthly logging files in CSV format One log line appended to the CSV file added with every logging interval fulfilment
Primary storage		By default internal disk on chip automatic data logging storage Free memory for user data logging: 112 MB, by default (optional up to 3.5 GB)
Local data download		Automatic download of all the logging files with USB pen drive detection 4 GB USB pen drive included
Remote data download		Through included FTP server
Security		By default: no encryption User configurable: Advanced Encryption Standard (AES), 128 bits
WEATHER & METEO INFO		

Current weather data		**Current value of weather parameters:**
		• coordinates
		  ○ City geo location, longitude
		  ○ City geo location, latitude
		• weather
		  ○ Weather condition id
		  ○ Group of weather parameters (Rain, Snow, Extreme etc.)

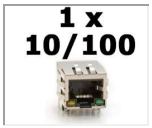
		○ Weather condition within the group ○ Weather icon id • parameters ○ Temperature. Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit. ○ Atmospheric pressure (on the sea level, if there is no sea_level or grnd_level data), hPa ○ Relative humidity, % ○ Minimum temperature at the moment. This is deviation from current temp that is possible for large cities and megalopolises geographically expanded (use these parameter optionally). Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit. ○ Maximum temperature at the moment. This is deviation from current temp that is possible for large cities and megalopolises geographically expanded (use these parameter optionally). Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit. ○ Atmospheric pressure on the sea level, hPa ○ Atmospheric pressure on the ground level, hPa • wind ○ Wind speed. Unit Default: meter/sec, Metric: meter/sec, Imperial: miles/hour. ○ Wind direction, degrees (meteorological) • clouds ○ Cloudiness, % • rain ○ Rain volume for the last 3 hours • snow ○ Snow volume for the last 3 hours • Time of data calculation, unix, UTC • local info ○ Country code (GB, JP etc.) ○ Sunrise time, unix, UTC ○ Sunset time, unix, UTC ○ City name
Weather forecast		Next 5 days weather forecast with data every 3 hours of the same parameters listed above
EMBEDDED USER SOFTWARE (FIRMWARE)		
Watchdog		Security against firmware hang up.
Current process values telemetry		Analog channels current value **telemetering** in user units, via Telegram templates. Digital channels current state **telemetering**, via Telegram templates.
Field actuators telecommand		Digital output channels remote **telecommand**, via Telegram templates.
Current process param. trending		Analog channels remote **trending** in percentage, via Telegram templates.
Current process param. alarms		Analog channels setpoints (Hi & Lo) **alarms**, including current value in user units, via Telegram Digital channels **alarms**, including current state info, via Telegram.

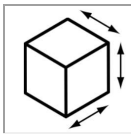
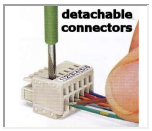
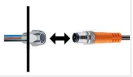
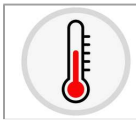
Configuration		User parameters **configuration**: ○ by default: editing an Excel data sheet template. ○ optional: with the operator panel. configuration data consistency check
Boolean logic functions		User **control boolean programming tools**: ○ AND, OR logic operators associated to digital physical and virtual inputs . ○ AND, OR logic operators result associated to digital outputs. ○ Analog inputs setpoints, thresholds or alarms can be configured as virtual digital inputs to logic operators.
Timers		User **timing programming tools**: ○ ***Crontab*** syntax based timers configuration. ○ intervals configuration. ○ time schedules related to time slots, day of the week/month, week, month, year, even/odd, ... ○ timers results associated to events (digital outputs control).
Analog inputs Calibration		Analog inputs **calibration**: ○ by default: factory calibrated. ○ optional: user calibration available if required.

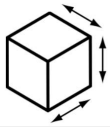
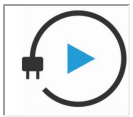
OPERATOR PANEL

Characteristics		• 4 x 20 characters LCD display. • 5 x state LEDs. • power supply: 9-24 Vdc, 1.2 W • key press confirmation sound • push button switch life: 100,000 presses. • backlight brightness control. • panel mounting.
Functions		• User parameters configuration. • Analog channels current value read out in user units. • Digital channels current state read out.

CONNECTIVITY

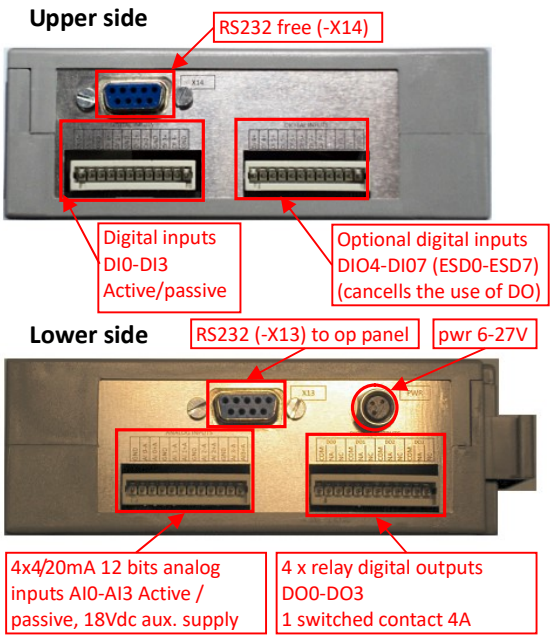
Ethernet		1x 10/100 Mbit with IEEE 1588, RJ45	
Wi-Fi		WiFi dongle for USB port (optional): ○ Operates in 2.4 GHz frequency bands ○ data rate up-to 150 Mbps ○ 802.11b/g/h-compatible	
External 4G router (optional)		Option **1**: Wireless router 4G LTE CAT4 • 150 Mbps download, 50 Mbps upload • Supply: 9-30 Vdc, 5w • 1 WiFi IEEE 802.11 b/g/n • 1 LAN, 1 WAN 10/100 • 1 x SIM, 1DI/1DO • 4 pole (Vdc/GND/1DI/1DO) microfit connector with 1 meter cable • Aerials: 2 x LTE (2 ud.) / 1 x WiFi • **Plug & Play: preconfigured and tested with Iris Box TRS**	Option **2**: Wireless router 4G LTE CAT4 • 150 Mbps download, 50 Mbps upload • Supply: 9-30 Vdc, 5w • 1 WiFi IEEE 802.11 b/g/n • 3 LAN, 1 WAN 10/100 • 2 x SIM, 2DI/2DO • 1 x RS232 port, DB9 connector • detachable industrial clamp connectors • Aerials: 2 x LTE / 2 x WiFi / 1 x GPS • **Plug & Play: preconfigured and tested with Iris Box TRS**

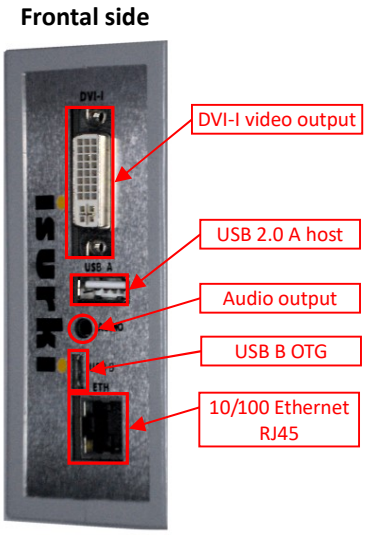
OPERATING SYSTEM		
Operating system (OS)		Toradex Yocto Project 2.8 with Linux kernel 4.1 for ARM v7
DIN RAIL MOUNTING EXECUTION (Factory Default)		
Dimensions		118 mm. (height) x 45 mm. (wide) x 137'5 mm. (deep)
Unit Mounting		DIN rail mounting
I/O wiring		Detachable connectors for input & outputs wiring Operation parallel or perpendicular to conductor entry using a 25x0.4 mm screwdriver Wire section: 0.08 to 0.5 mm^2 / AWG 28 -20 Pin spacing 2.5 mm.
PWR wiring		Power supply wiring Security detachable aerial connector with 0.5 m. of cable included
Working temperature		Standard: 0° to 70° C Extended (optional): -40° to +85° C

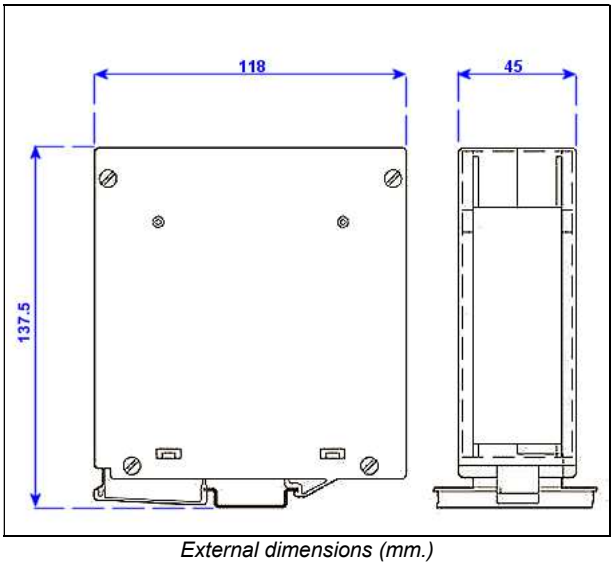
OUTDOOR CABINET EXECUTION (optional)		
Dimensions		Polyester IP66 outdoor cabinet, 425 (height) x 325 (width) x 180 (deep), including wall mounting accessories. All selected devices mounted, wired and tested
Plug & Play Execution		Outdoor plug & play execution: • all ordered devices are completely preconfigured, mounted, wired and tested. • power supply input and I/O signals connection through identified 2.5mm^2 pressure clamps. • wiring schematics included.
Remote Reboot		TRS independent remote reboot
IP protection degree		IP 66 NEMA 4
Security devices included		Security devices mounted and wired (AC input supply): ○ bipolar IP66 embedded switch with led indication. ○ overcurrent (6A) and shortcircuit (10 kA) thermal protection bipolar switch. ○ selected optional surge arrestor.
Special options		Key lock for cabinet door.

ORDER CODE IRIS BOX TRS						
_-	OP_-	RIO_-	4G_-	SA_-	UPS_-	ENC_
CPU (SoM)	**Operator Panel**	**ETH Remote I/Os**	**4G preconfigured plug & play router**	**Surge arrester (Overvoltage protection)**	**Uninterruptible Power Supply**	**Enclosure execution**
ULL ARM Cortex™-A7, 528 MHz, 256 MB DDR3L, 512 MB NAND	**0**: without **1**: LCD display 4x20 char.	**0**: without **1**: 4DI/4DIO/4 AI **2**: 16DI	**0**: without **1**: Plug&Play, LTE, 2xETH, WiFi, 1xSIM, 1DI/1DO **2**: Plug&Play, LTE, 4xETH, WiFi, 2xSIM, 2DI/2DO	**0**: without **1**: SA for 30 Vdc **2**: SA for 240 Vac (fault indication led & relay).	**0**: without **1**: 12V/40W & 1.2 A/h batt. **2**: 12V/40W & 5 A/h batt.	**0** DIN rail mounting. **1**: Outdoor cabinet.
SOLO Arm Cortex™-A9, 1.0 GHz, 256MB DDR3 (32 Bit), 4GB eMMC	**0**: without **1**: LCD display 4x20 char.	**0**: without **1**: 4DI/4DIO/4 AI **2**: 16DI	**0**: without **1**: Plug&Play, LTE, 2xETH, WiFi, 1xSIM, 1DI/1DO **2**: Plug&Play, LTE, 4xETH, WiFi, 2xSIM, 2DI/2DO	**0**: without **1**: SA for 30 Vdc **2**: SA for 240 Vac (fault indication led & relay).	**0**: without **1**: 12V/40W & 1.2 A/h batt. **2**: 12V/40W & 5 A/h batt.	**0** DIN rail mounting. **1**: Outdoor cabinet.

Ordering example: ***IRIS BOX TRS-ULL-OP1-RIO1-4G1-SA0-UPS2-ENC0*** unit code stands for ARM Cortex™-A7, 528 MHz, 256 MB DDR3L , 512 MB NAND CPU, LCD 4X20 char. operator panel, extended ethernet remote I/O module with 4DI/4DIO/4AI, 4G router with accessories, no over voltage protection with surge arrester, UPS with 5A/h battery, execution for DIN rail mounting



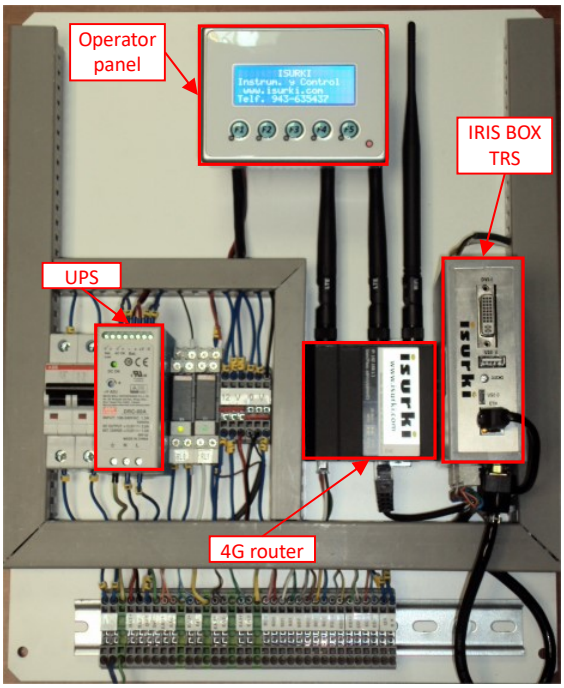




External dimensions (mm.)

HARDWARE MOUNTING AND RUNNING APPLICATIONS EXAMPLES

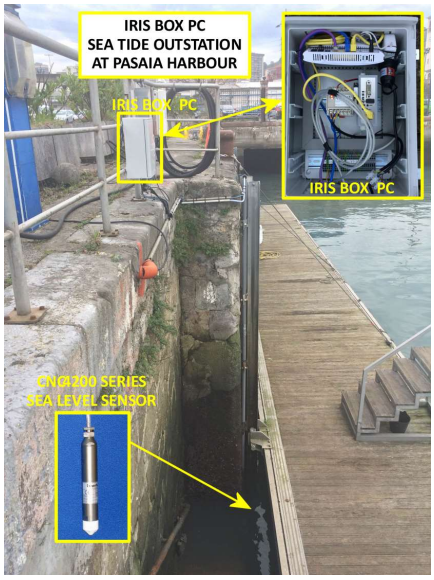
IRIS BOX TRS unit in DIN rail mounting execution (factory default)



Example of cabinet execution in a Plug & Play version for outdoor installation and 230 Vac supply.

Hatchery input flow logging station.

Fresh raw water reservoir telecontrol outstation.



Sea tide vectors breakdown measurement, logging and telecontrol outstation.

Shoreline videometric outstation

IRIS BOX TRS AS A TORADEX® ARM SoM COLIBRI FAMILY BASED TRS

Toradex
Swiss. Embedded. Computing.

ISURKI has been awarded by the renowned swiss firm TORADEX as member of his Partner Program: https://www.toradex.com/support/partner-network/hardware/17/iris-box-pc-embedded-kit-by-isurki

ARM Community

And is also member of the ARM Community: https://community.arm.com/b/inaki-s-documents/posts/arm-based-industrial-din-rail-box-pc-with-input-outputs-board

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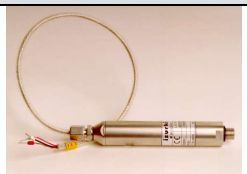
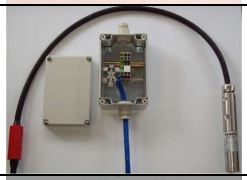
LIST OF AVAILABLE VIDEO TUTORIALS

IRIS BOX (BASIC UNIT)		
Description	**Link**	**Contents**
1.- Introductory video	https://youtu.be/28R5CDcZsZI	The basic ideas in which IRIS BOX concept is based
2.- Outer view and connectivity	https://youtu.be/7vcTDXAEHps	External view, format and connectivity
3.- Inner view and composition	https://youtu.be/kO_MTS0vqUc	Inner view and different boards lay out
4.- Connectivity with peripherals and field devices	https://youtu.be/Bs_rVip8h50	plug & play connectivity to external peripherals and field devices

RELATED PRODUCTS		
Description	**Presentation**	**Features and Data Sheet link**
Water level sensors		CNC4200 series 4 to 20 mA output signal from 1 up to 220 m.w.c. f.s. Fresh & Marine water
Water temperature sensors		CNT4200 series 4 to 20 mA output signal -10 to +60 ºC range Fresh & Marine water
Water level detectors		IN66 series Submersible Static Fresh & Marine water
Surge arrestors		Over voltage protectors for instrumentation and control devices • For sensors signals, outdoor, ref. AT30E. • For sensors signals, DIN rail, ref. AT30I. • For single phase 230Vca lines, AT220.
Sensor Access Point		SAP: Sensor Access Point of IIoT IRIS ecosystem • Embedded and external sensors • Plug & Sense sensors packs • Wireless • Self powered and ulta low power consump. • Harsh environments
ARM industrial computer		IRIS BOX PC series ARM based industrial computer with embedded inputs & outputs Digital and analog Linux, Windows CE, Android, Ubuntu

ISURKI'S BACKGROUND EXPERTISE AND SUPPORT

ISURKI was founded in 1.992 with the target of providing the industry and the resources and facilities management companies the most advanced electronic, computing & communications technologies in order to improve the supervision and control of their processes and infrastructures.

Iñaki Mutuberria, CEO

Therefore, we define ourselves as an instrumentation, control & software engineering firm focused to the different areas related to the industrial and environmental fields.

The **IRIS BOX TRS** is the result of the application of all this expertise into the hardware and software design of the device, allowing us to develop tailored cost effective industrial controllers adapted to specific customer's requirements.

Last, but not least, an excellence based technical assistance and hot line service during the previous and after sales stages, together with the support of our partner and supplier TORADEX, guarantee the best results of the **IRIS BOX TRS** unit in your application.

Company headquarters in Irun, Basque Country, Spain

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