Signatrol.com
Data Logging Solutions

SpYdaq Transmitter [mk2]
Quick Start Guide.
(Room Type)

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Introduction

spYdaq® is a system comprising of a number of radio transmitting sensors that measure parameters and send them securely by using a licence free radio network to a central Base-station. Each Transmitter is battery powered, and has the ability to send up to 3 parameters via RF to the Base-Station. The maximum range is 400metres (line of sight). An addition repeater is available for extended distances or noisy environments.

Models Covered by this Guide.

SPYDAQ-1001-T   SPYDAQ-1001-TH   SPYDAQ-1001-THU


Release top cover by depressing tabs.
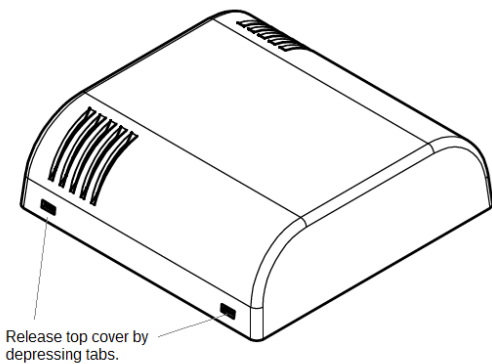
Getting Started

The spYdaq transmitters are supplied from the factory in the power OFF state.

Configuration

Carefully open the transmitter enclosure by depressing the two tabs with a small screwdriver. The battery should be pre-installed within the unit. All configuration is made using the USB Mini-B connection to a Windows PC running spYconfig (Version 1.0.22 or above).

The example screenshot below shows the the parameters which can be changed and information on the transmitter connected.
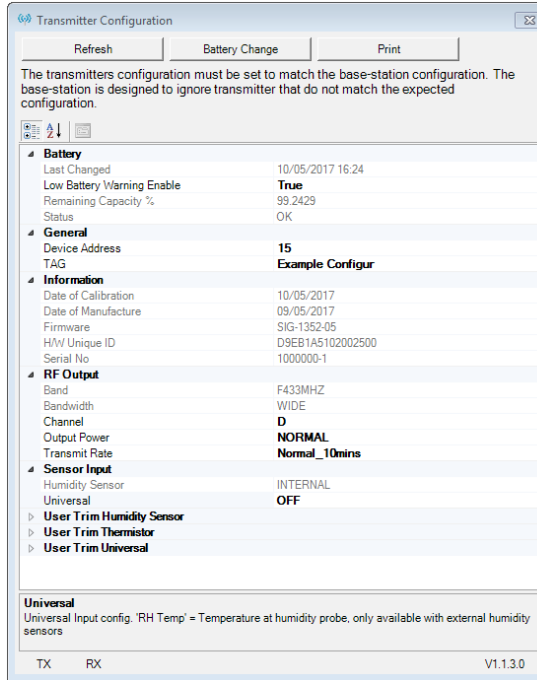

Each Transmitter must be given a unique Device Address between 0 and 15, and a Channel of either A,B,C or D. The Channel corresponds to a pre-defined RF frequency. The Transmit Rate determines how often the transmitter will take sensor measurements and transmit the data to the base-station. The factory default value is 10minutes, this gives a good balance between the amount of data obtained and the expected battery life. Reducing Transmit Rate down to 1minute will significantly reduce battery life.

All transmitters have internal temperature channels fitted as standard, this channel cannot be disabled. Some transmitters models also have internal humidity channels fitted, humidity channels can not be disabled either. The universal channel can be selected for sensor type. Most transmitters have a universal input connector which allows connection to common Temperature/Process Signals. Configure the transmitter for the matching sensor type. The configuration of the transmitter must be later programmed into the base-station. The base-station will only accept data from transmitters which match its saved transmitter configuration.

Universal Sensor Connections (J5)

### External sensor information.
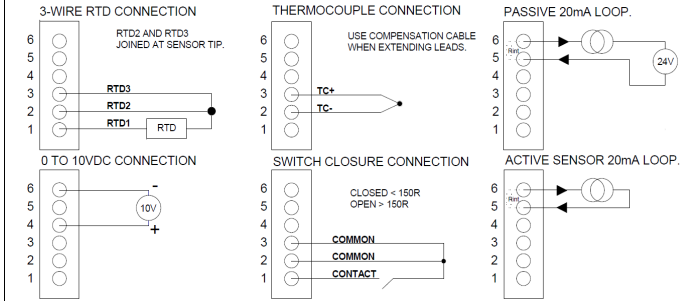
3-wire RTD Temperature sensors are normally wired with 2 red and 1 white conductor. Connect the white conductor to RTD1, then 1 red to RTD2 and 1 red to RTD3. Do not connector RTD2 and RTD3 together at the connector.

Thermocouples should be connected using the correct compensation cable. Sensor tips should be isolated type. Check with the sensor manufacturer for the correct colours for +ve and -ve conductors.

When using 4-20mA loops the transmitters input is passive, an external power source is required to excite the loop.

Isolation Note: the spYdaq input sensor is not isolated from the USB port, this may result in incorrect measurements being recorded when the USB is connected. This is normally due to grounded or non-isolated input sensors. Connecting a USB isolator between the computer and the transmitters USB connector will overcome this issue.
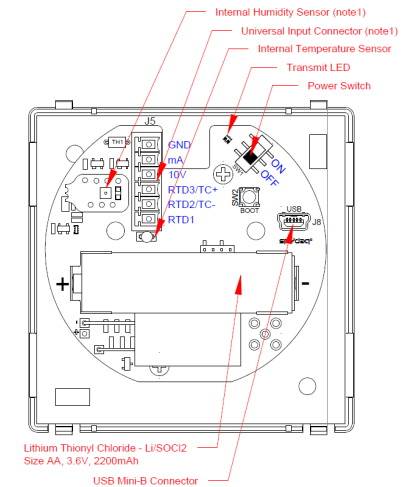
Note1: Humidity & Universal channels are model dependant.

Calibration: All calibration data is held within the spYdaq transmitter, this is held together with the date of the last calibration. The spYdaq transmitter sends the last calibration date every time information is sent to the base-station. Signatrol Ltd recommend as 12-month calibration interval. Please contact your agent for more information about our calibration services.

Battery: All transmitters come with a new battery fitted. Life is dependant on transmit rate and ambient temperature conditions. Replacements are available from your supplier.

Estimated battery life (Ambient Temperature -10 to +50°C)

RF Power Setting	Transmit Rate 1 minute	Transmit Rate 10 minutes	Transmit Rate 30 minutes
Low	1.4 years	7.9 years	12.6 years
Normal	1.3 years	7.6 years	12.4 years
High	1.2 years	7.4 years	12.0 years

Replacement Battery:

Signatrol Part No:	SPYDAQ-ACC-01
Type	Lithium Thionyl Chloride (Li/SOCl2)
Voltage	3.6V
Capacity	2200mAh
Cell Temp Range	-55 to +85°C
Size	AA

Low Battery Warning: The transmitter uses a coulomb counting technique for estimating battery life as Lithium Thionyl Chloride batteries cannot be checked for capacity based on output voltage. Using this technique the transmitter will indicate a low battery when the total cell capacity falls below 10%. The remaining capacity value (0 to 100%) is viewable in spYconfig using the USB connection. The battery capacity calculation is only accurate if the battery calculations are reset every time the battery is replaced with a new battery. This can be done through spYconfig. Never fit used batteries as the system will not generate the correct low battery warning.

Battery Warning: Fire, explosion and severe burn hazard. Do not recharge, crush, disassemble, heat, above 212 °F (100 °C), incinerate, short circuit or expose contents to water. Keep battery out of reach of children. Dispose of used batteries promptly and safely.

Operating Ranges:

Channel	Internal Temperature
Sensor Type	NTC Thermistor
Max Temperature Range	-40 to +105°C
Operating Range within Enclosure	-30 to +55°C
Accuracy	±0.2°C (-20°C to +50°C) ±0.5°C (-35°C to +100°C) ±0.8°C (-40°C to +105°C)
Resolution	0.05°C

Channel	Internal Humidity (model dependant)
Sensor Type	Digital
Max Humidity Range	0 to 100% RH
Operating Range within Enclosure	5 to 95% RH

Accuracy Typical	±2% (0 to 100% RH)
Accuracy Maximum	±2.5% (0 to 90% RH) ±3.5% (> 90% RH)
Resolution	0.43% RH
Repeatability	0.1% RH + Resolution
Hysteresis	±0.8% @ 25°C
Long Term Drift	< 0.25%/Year (Typical) <0.5%/Year (Maximum)
Response Time (t63%) @ 25°C	20 seconds (airflow 1m/Sec)

Channel	RTD (Resistance)
Sensor Type	External Resistance 3-wire Measurement
Configuration Pt100 EN70651 (fundamental 38.5 ohms)	Range: -200 to +550°C Accuracy: ±0.1°C ±0.05% Reading Thermal Drift Zero: 0.025°C/°C Thermal Drift Span: TBC Resolution: 0.05°C Specifications above exclude sensor errors.
Configuration Pt100 JISC (fundamental 39.2 ohms)	Range: -100 to +450°C Accuracy: ±0.1°C ±0.05% Reading Thermal Drift Zero: 0.025°C/°C Thermal Drift Span: TBC Resolution: 0.05°C Specifications above exclude sensor errors.
Configuration Ni100 (0.00618 coefficient)	Range: -55 to +175°C Accuracy: ±0.1°C ±0.05% Reading Thermal Drift Zero: 0.015°C/°C Thermal Drift Span: TBC Resolution: 0.05°C Specifications above exclude sensor errors.
Configuration Ni120 (0.00672 coefficient)	Range: -70 to +200°C Accuracy: ±0.1°C ±0.05% Reading Thermal Drift Zero: 0.015°C/°C Thermal Drift Span: TBC Resolution: 0.05°C Specifications above exclude sensor errors.
Configuration Ohms	Range: 1 to 300 ohms Accuracy: ±0.04Ω ±0.01% Reading Thermal Drift Zero: 8mΩ/°C Thermal Drift Span: TBC Resolution: 19mΩ

Channel	Thermocouple (mV)
Sensor Type	External emf
Configuration T/C "T"	Range: -190 to +400 Accuracy: ±0.05% FSD ± CJ Thermal Drift Zero: 1μV/°C Thermal Drift Span: TBC Resolution: 0.1°C Specifications above exclude sensor errors.
Configuration T/C "K"	Range: -160 to 1200°C Accuracy: ±0.05% FSD ± CJ Thermal Drift Zero: 1μV/°C Thermal Drift Span: TBC Resolution: 0.1°C Specifications above exclude sensor errors.

Configuration T/C "J"	Range: -180 to 840°C Accuracy: ±0.05% FSD ± CJ Thermal Drift Zero: 1μV/°C Thermal Drift Span: TBC Resolution: <0.1°C Specifications above exclude sensor errors.
Configuration T/C "R"	Range: +200 to 1755°C Accuracy: ±0.1% FSD ± CJ Thermal Drift Zero: 1μV/°C Thermal Drift Span: TBC Resolution: <0.5°C (above 400°C) Specifications above exclude sensor errors.
Configuration T/C "S"	Range: +200 to 1755°C Accuracy: ±0.1% FSD ± CJ Thermal Drift Zero: 1μV/°C Thermal Drift Span: TBC Resolution: <0.5°C (above 400°C) Specifications above exclude sensor errors.
Configuration mV	Range: -8 to +49mV Accuracy: ±0.025% FSD Thermal Drift Zero: 1μV/°C Thermal Drift Span: TBC Resolution: 4μV

CJ (Cold Junction) See Internal Temperature error

Channel	D.C Voltage (V)
Sensor Type	External emf
	Range: 0 to 10.01V Accuracy: ±0.025% Thermal Drift Zero: TBC Thermal Drift Span: TBC Resolution: 0.7mV

Channel	D.C Current (mA)
Sensor Type	External current
	Range: 0 1 to 21mA Accuracy: ±0.03% Thermal Drift Zero: TBC Thermal Drift Span: TBC Resolution: 1.3μ

Channel	RH Temp
Sensor Type	Temperature of external humidity sensor.
Accuracy Typical	±0.2°C (0 to +90°C) ±0.4°C (-40 to +100°C) ±0.5°C (> +100°C)
Accuracy Maximum	±0.4°C (-40 to +90°C) ±0.7°C (> +90°C)
Resolution	±0.04°C
Repeatability	0.06°C + Resolution
Long Term Drift	< 0.03°C/Year (Maximum)

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