

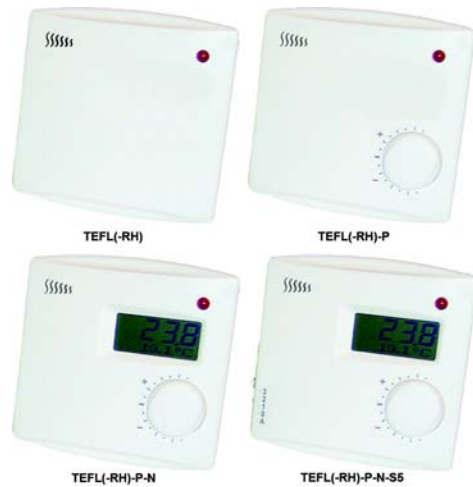
## TEFL Wireless Room Transmitters

TEFL wireless room sensors operate in 868.30MHz range. They have been designed for reliable operation in wide range of environments using the latest RF technology. The communication between the TEFL room units and the FLTA control module is two-way. The measurement readings are transmitted on change, or at least every hour.

The FLTA control module monitors the room units for any malfunctions and for the low battery level. TEFL wireless sensors have battery operating life up to 6 years (3 years for display model).

Each FLTA control module can have up to 99 room sensors in its operating area. Up to 63 control modules can operate in the same wireless area. Total maximum of 6,237 sensors can be connected to the system in a single system.

Each TEFL room sensor is configured at the commissioning stage with its own identification number (SID) and the control module number (MID). It is possible to supply sensor pre-addressed. The addressing is done using FLSER Configuration Tool. FLREP and FLREP-U repeaters can be used to extend and boost the range in difficult environments. It possible to use up to 8 repeaters.



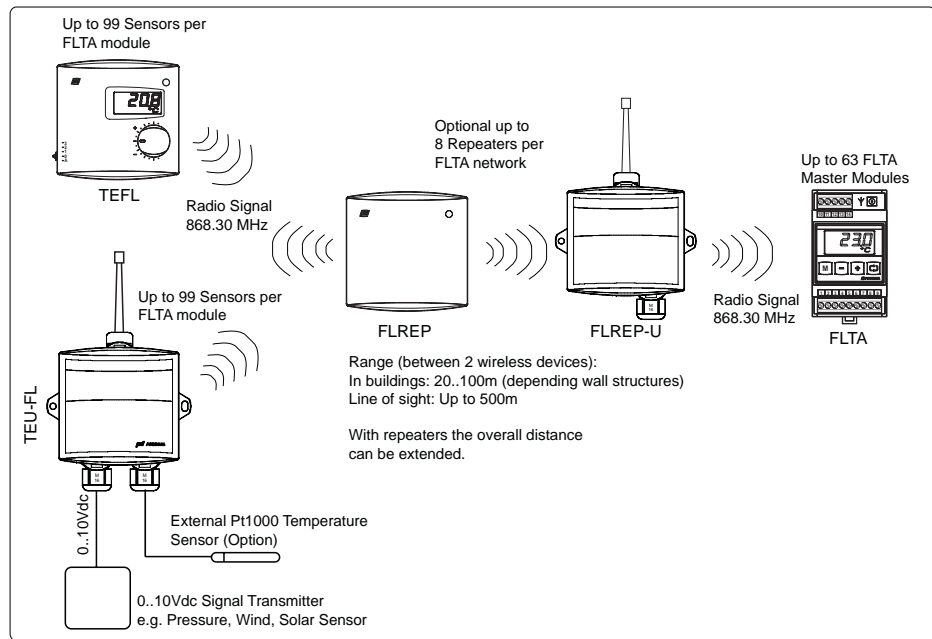
FLTA control module has 8 x 0..10Vdc outputs that can be configured for temperature, humidity, setpoint, digital signal or 5-position switch. FLTA module acts also as a Modbus Communication interface for sensor readings. FLTA is often connected using Modbus to BMS systems. Using FLTA modules temperature readings can be made available, for example, on the WetBiter web-browser interface.

Model Type	Model	Description
	<b>TEFL</b>	Wireless Room Temperature Sensor
	<b>TEFL-RH</b>	Wireless Combined Room Temperature and Humidity Sensor
	<b>-P</b>	Setpoint Option for Wireless Room Sensors
	<b>-S5</b>	5-Position Switch Option for the Wireless Sensors
	<b>-N</b>	LCD Display Option for the Wireless Room Sensors
	<b>-DI</b>	Digital Input Option (S5 option is not available with DI-option)

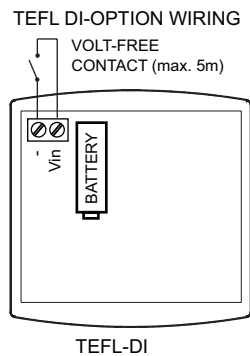
Technical Data		
Power supply	TEFL - 3V6 AA Lithium battery 2Ah	
Battery Life	Up to 6 Years Up to 3 Year with Display (Optional Model)	
Transmission Frequency	868.30 MHz	
Transmission Power	+8 dBm	
Reception Sensitivity	-109 dBm	
Modulation Technology	FSK	
Transmission Range	Line of sight: Up to 500m In buildings: 20..100m, depending on the wall materials FLREP and FLREP-U modules can be used to extend the transmission range in difficult environments.	
Measurement Range	TEFL: Temperature: 0..50°C TEFL-RH: Humidity: 0..100% rH (non-condensing)	
Measurement Accuracy	TEFL: Temperature: +/- 0.5°C (at 25°C) TEFL-RH: Humidity: +/-2% rH (at 25°C)	
-P Option	Setpoint Option: 17.5 .. 24.5°C	
-S5 Option	5-Position Switch: A-0-1-2-3	
-N Option	LCD Display Option for temperature, humidity and setpoint adjustment setting	

	-DI	Digital Input Option: Open - Closed
	Agency Approvals	EU Directive 2004/108 EMC Emissions EN61000-6-3: 2001 EMC Immunity EN61000-6-2: 2001
	Operating temperature	0°C...+50°C
	Ambient humidity	5...95%rh (non-cond.)
	Dimensions (Sensors)	86W x 85H x 30D mm
	FLTA Module Outputs	TEFL wireless sensors send the signals to the FLTA receivers that convert the signals to either 0..10Vdc analogue signals or the information can be read via Modbus RTU (RS485). Translation of Wireless Signals to 0..10Vdc Outputs: Temperature 0...50°C / 0...10V Humidity 0...100% / 0...10V Setpoint 17.5...24.5C / 0...10V 5-Position Switch 1...5V (e.g.. position 3 = 3V) Digital Input: 1V = Open, 5V = Closed
<b>Firmware Version</b>		TEFL wireless sensors supplied after date 10.11.07 use version 2 software. Version 2 is not compatible with version 1. If you require extensions to version 1 network (products supplied before Nov 2007), please state this at the time of ordering.
<b>Order Options</b>		Wireless room sensors can be ordered with optional setpoint adjustment knob (-P), with optional 5-position switch (A-0-1-2-3, -S5), Digital Input (-DI) or with LCD display (-N). Any order combination is available except only -DI or -S5 can be fitted any given time.
		EXAMPLE Requirement: Room Temperature and Humidity with Display, Setpoint Adjustment Order Code: TEFL-RH-P-N
<b>LCD Option</b>		LCD display option is available for both temperature and combined temperature and humidity sensors. Operation of the display is as follows:-  TEFL Temperature Sensors; the display shows the current temperature reading and the current setpoint adjustment setting (if the -P option has been installed)  TEFL Combined Temperature and Humidity Sensors: the display alternates between the temperature and humidity readings. If the -P option has been installed the setpoint setting is shown below the room temperature reading.
<b>Data Transmission Frequency</b>		TEFL room transmitters send information to the FLTA when:- -Temperature changes more than +/-0.2°C compared to the previous transmission -Setpoint adjustment changes more than +/-0.1°C compared to the previous transmission -RH% relative humidity reading changes more than +/-1% compared to the previous transmission -Battery Capacity is less than 10% -5-position switch position is changed -Digital Input contact position is changed  However if none of the above transmissions has been made, then the TEFL transmits its information every one hour.
<b>Failure Diagnostics</b>		-Communication errors: LED flashes every 8 seconds -Low Battery: LED flashes every 4 seconds Communication errors and Low Battery: LED flashes every 2 seconds

**Communication Diagram Example**



**TEFL-DI Wiring Diagram**



TEFL transmitters with -DI option allow transmission of digital contact signals wirelessly to the FLTA receiver / master module. The diagram on the left illustrates the DI-option wiring (volt-free contacts).

**TEFL Commissioning (required only if TEFL is not pre-addressed at SyxthSense)**

TEFL wireless transmitters operate at 868.30Mhz frequency and are transmitting measurements to the FLTA receivers / master modules. Each TEFL transmitter is required to be commissioned to operated in the FLTA network. Up to 99 TEFL transmitters can operate in a single FLTA network.

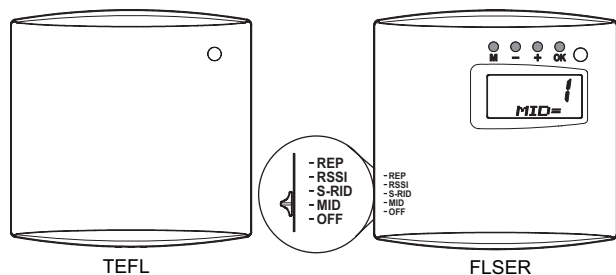
Note. TEFL transmitters can be supplied as pre-addressed. If the TEFL transmitters have been pre-addressed the following procedure is not required.

**CONFIGURING TEFL TRANSMITTERS**

1. Select MID position on the FLSER service tool. Select using +/- buttons the required Master ID (MID 1..63).

**Note:** Typically the master ID is set as 1 if only one wireless FLTA network exists in the building.

**CONFIGURING TEFL**

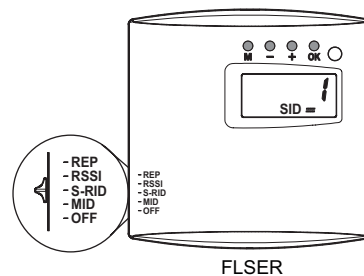


2. Please select S-RID on the FLSER service tool switch. SID is displayed on the screen. (Note: SID = OFF means that the sensor address has not been assigned and the sensor is dormant).

- Remove the TEFL sensor cover and remove the battery. Note the battery polarity.

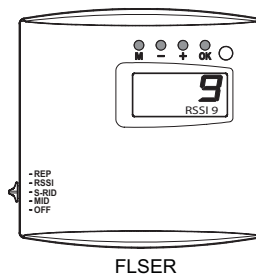
- Select sensor SID address by pressing + and - buttons.

- Press OK button after which the "WAIT" text starts to flash for 30 seconds on the FLSER service tool. Bring the FLSER service tool close to the TEFL and power the sensor by plugging in the battery.



4. FLSER service tool sets the address of the TEFL sensor/transmitter. Once the TEFL has been successfully addressed the LEDs on the TEFL and FLSER flash in sequence for 5 times, and the FLSER display shows OK. The TEFL is now operational.

5. The FLSER service tool now shows the signal strength from the TEFL to the service tool and back. Signal strength RSSI 1-2 = low signal quality, RSSI 3-5 = acceptable, RSSI 6-9 = good signal strength. The large number illustrates the FLSER service tool signal strength and the small number the TEFL signal strength.



6. Finally switch the FLSER switch to OFF position. Now the TEFL returns to normal mode and starts to communicate to the FLTA receiver.