

GENERAL INFORMATION

1.1. Product description

The TBOS Radio Relay can be used in 2 configurations:

- To increase radio range between TBOS-II™ Field Transmitter and standalone TBOS™ or TBOS-II™ Control Modules equipped with a TBOS-II™ Radio Adaptor (even with no Central Control System)
- To build a radio network centralized on IQ V2 Software. A TBOS-IQ Radio Network consists in one IQ-TBOS Master Radio Module installed in an ESP-LX Series Controller and one or several TBOS Radio Relay relaying information on the field to TBOS Controllers.

The TBOS Radio Relay has to be installed in height position to optimize radio range (Please see Installation Chapter of this Manual).

To install TBOS Radio Relay, you will need your TBOS-II™ Field Transmitter. Please see its User Manual to proceed with the following steps.

Each TBOS Radio Relay allows:

- Radio communication with up to 15 other radio relays.
- Radio communication with up to 32 TBOS™ or TBOS-II™ controllers equipped with TBOS-II™ Radio Adaptor.

INITIAL START-UP

Radio Marking

We recommend proceeding to Radio Marking before installation of the relay in height position, in order to be able to communicate with the relay.

Radio marking is a key step during installation of a radio device.

To be able to communicate via radio, all radio devices (Field Transmitter, Radio Adaptor, Master Radio Module and TBOS Radio Relay) must have the same Radio Network Number. The Radio Network Number is a 4-digit code transmits to any radio device by the TBOS-II™ Field Transmitter during its Radio Marking. The Radio Network Number secures your network by limiting risk of interferences with other IQ-TBOS networks.

The Radio Marking is done in 3 simple steps:

- On the Field Transmitter, go on Radio Marking screen (TBOS Radio Menu / Radio Marking)
- On TBOS Radio Relay, activate the initialization trigger to place the relay in “waiting” mode – During 20 seconds the relay is waiting for its Radio Network Number.
- Validated by pressing OK on the Field Transmitter within the 20 seconds.

Radio Marking is only done once, at first installation.

When all radio devices are marked with a common Radio Network Number, network building could be launched from IQ software.

Radio Network Number Customization

**It is highly recommended
to customize the Radio Network Number of each Radio Network.**

UTILIZATION

Automatic finding of Radio Relays

Launch an automatic finding of the radio relays with your TBOS-II™ Field Transmitter (See Instruction Manual of TBOS-II™ Field Transmitter)

The list of radio relays within the Field Transmitter radio range (TBOS Radio Relays and IQ-TBOS Master Radio Module) is displayed on transmitter screen. From this list you are able to:

- Rename a relay
- Launch an automatic finding command of TBOS™/TBOS-II™ controllers equipped with TBOS-II™ Radio Adaptors. All settings and programming operations of the controllers are doable from your transmitter, thru the relay.
- Launch an automatic finding command of secondary relays

The ability to find secondary radio relays (Test relay) allows using your Field Transmitter as a tool able to help you in installation and definition of the best location for relays of an IQ-TBOS Radio Network. During finding of secondary radio relays, the transmitter displays the radio reception level of each secondary relay in the list. This information will help you to find the best location for your new relay.

Then, Radio Network building is launch from IQ V2 Software (See Help Section of your IQ software)

**Please read the IQ-TBOS Specifications and Installations Guide to
know more about radio network management.**

IQ V2.0 Central Control System.

Your TBOS Radio Relay can be integrated in a Radio Network centralized on IQ V2.0 Software.

A Radio Network is built on a based Master Radio Module (installed in an ESP-LX Series satellite) and if necessary, one or several TBOS Radio Relay(s). The Master Radio Module and/or Radio Relays have capability to communicate with one or several TBOS Controllers equipped with TBOS-II Radio Adaptors.

To communicate, those radio devices MUST have thesameRadioNetworkNumber.

Each Master Radio Module (or each radio network) MUST have adifferentRadioNetwork Number.

1.2. Related Submittal(s) / Grant(s)

All host equipments used in the test configuration are FCC granted, when relevant.

1.3. Tested System Details

The FCC IDs for all equipment, with description of all cables used in the tested system are:

- Internal max frequencies: 32MHz

- **Input/output:**

- 1 x Power supply, 2 wires unshielded, 12VAC

- **Auxiliaries used for testing:**

- None

- **I/O cables used for testing:**

- 2 x wires unshielded, length: 2m

- **Equipment information:**

- External antenna connector: NO, special EUT with connector for conducted tests.
- Radiated fundamental frequency band: [915.5-926.5]MHz, twelve channel
- Antenna type: Integral
- Stand By mode: Yes
- Normal power source: 12VAC and internal lead battery 6VDC.
- Modulation Type: FSK +/- 140kHz
- Modulation Technology: DSSS
- Transfer rate: 38400 bps
- Maximum Antenna Gain: 0 dBi

1.4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-2003, FCC Part 15 Subpart C.

Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.5. Test facility

Tests have been performed from December 01st to 14th, 2011.

This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4-2003 in a letter dated March 25th, 2008 (registration number 94821). This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, accreditation number 1-1633 as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.