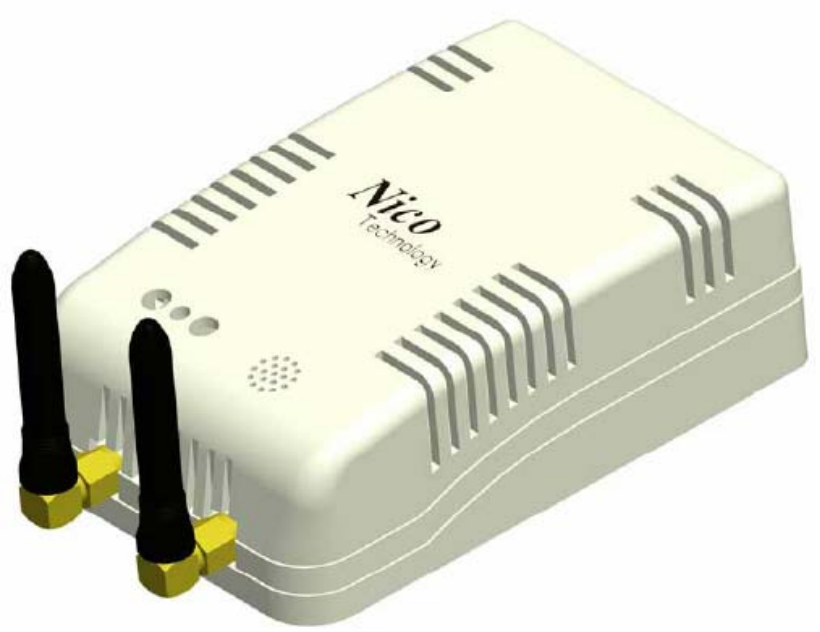
7600RF RF Receiver

Manual

Revision 2.1E



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This Manual

This manual provides any required information for installation, configuration and operation of the 7600RF RF Receiver.

It exclusively treats the handling of this device. It neither describes the LonWorks technology by Echelon nor the LonMark profile implemented in detail. More specific information concerning these subjects can be found in the documentation of Echelon (www.echelon.com) and the LonMark Interoperability Association (www.lonmark.org).

The first part of this manual provides a survey about the device and its installation in chapters 1 to 3. The 2nd part describes the implemented application for lighting control and its configuration possibilities. Chapter 4 contains a description of the firmware interface while chapter 5 describes the implemented LonMark Objects in detail providing an outlook of the individual objects, their tasks and their relevant configuration parameters.

Chapter 6 explains the basics required to connect the objects to each other.

This manual is relevant for all variants of the 7600RF RF Receiver where applications for lighting and switch control are implemented.

Contents

2 Product Information

2.1 Functional Elements

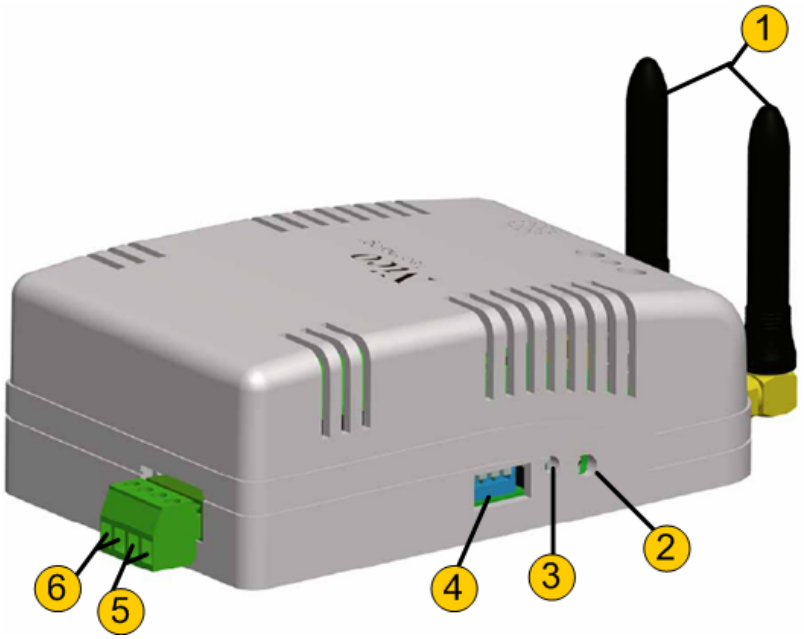


Figure 1.1 7600RF RF Receiver

No	Description
1	Wireless antenna
2	Service pin button
3	Service LED indicator
4	DIP switch for wireless channel ID setting
5	LonWorks network connector
6	Power supply. 12~24VDC

2.2 Variants and Identifications

2.3 Scope of Delivery

3 Installation

This chapter first describes the installation of the device; the installation of the configuration software is described in section 2.4.

3.1 Warnings

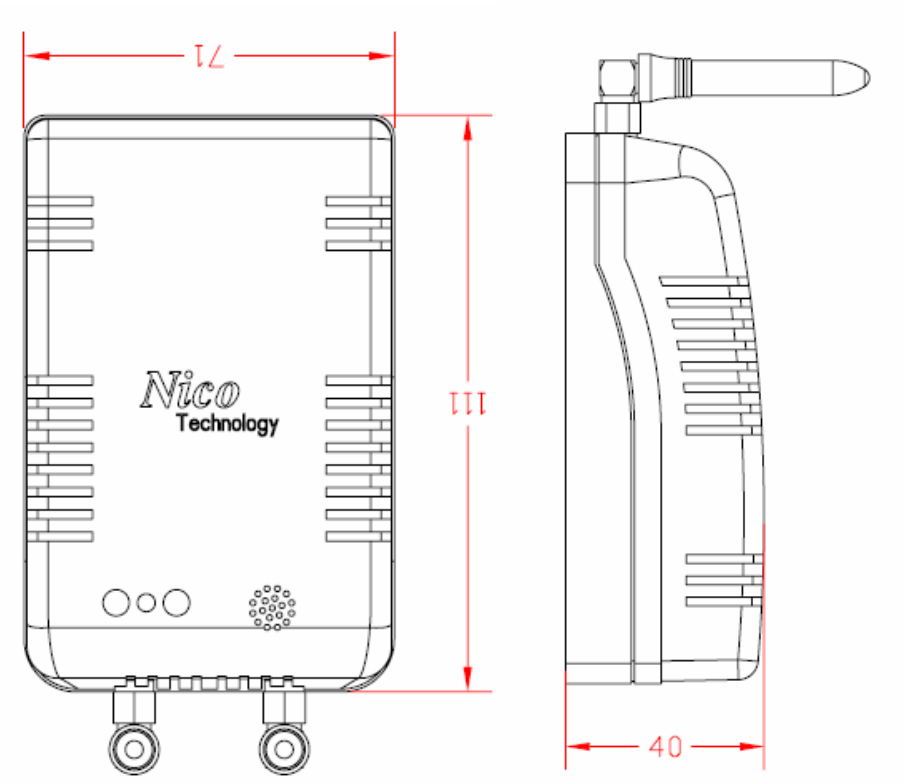
Attention

The device must be installed in compliance with the relevant DIN/VDE regulations or the relevant national standards. The connection to the supply voltage must be performed in accordance with VDE 0100 and VDE 0160 or the relevant national standards. Installation should perform by qualified and technical experienced personnel only.

CAUTION

At the connections of the LonWorks network 1 – 4 (Fig. 1.1, terminals 5) and the power supply (terminals 6) 12~24VDC main voltage with load guard band is accessible. The installation of the unit therefore has to be effected in a switch cabinet or behind a respective cover.

3.2 Mounting



3.3 Connections

The 7600RF has to be connected to a 12~24VDC power supply and to the LonWorks network. According to the respective application peripheral equipment has to be connected to outputs.

Attention

Before connecting peripheral equipment the power supply device has to be switched off.

The connection is effected by means of the included screw less terminals.

Clamping range of the screw terminals:

- Power supply connections (5.08mm grid, terminals **6**): 0.2 – 2.5mm

The pin assignment of the connections is described in chapter 3.1, also containing wiring details.

Voltage

The 12~24 Volt DC connections are through connected in order to achieve easy installation.

LonWorks Network

The connection to the LonWorks network is made by means of power line channels.

Attention

The 7600RF RF Receiver power supply recommend use 24VDC power supply.

3.4 Software Installation

The configuration software of the 7600RF RF Receiver has to be installed by starting the program Setup.exe on the data carrier provided. It suns under Windows 9x/2000 and NT.

Download url: http://www.nico-tech.com/download

4 Device Description

The 7600RF RF Receiver for LonWorks network in automation. Its peripheral scope has been specially designed for the use as valve controller for device spreading control of applications such as valve control or lighting control.

4.1 Hardware Survey

The 7600RF RF Receiver disposes of one LonWorks circuit for each.

4.2 Operation and Display Elements

The 7600RF RF Receiver is fitted with a service button accessible via a small gap on the front panel (see Figure. 1.1, **8**). Activation of the buttons generates a service-pin message transmitted via the LonWorks network. The processor status as well as the service-pin status are displayed by the service LED (figure. 1.1,**A**), which is on while the service button is activated.

4.3 Connection Pin Assignment

The following tables show the connector pin assignment of the individual connectors. Connections the ***1*** marking cf. Figure. 1.1 On previously page. In each clamp block pin 1 is situated on the left. For further wiring information see figure 3.1.

LonWorks Network Connection

The double-core bus line can be connection either to Net . No polarity has to be considered by connecting the LonWorks network.

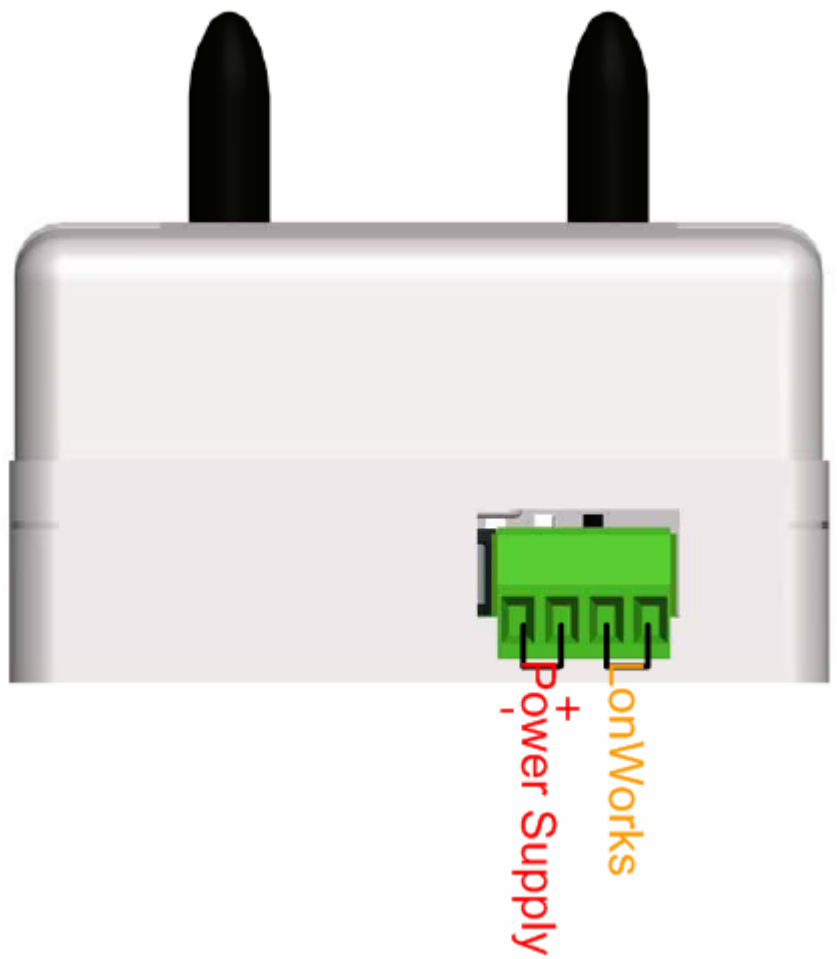


Figure 3.1 Connector pin assignment LonWorks network

4.4 EMC

The 7600RF RF Receiver is a CE certified device according to the regulation 89/336/EEC for electron magnetic compatibility, modified by 92/31/EEC". Concerning the emission it fulfills classification B (living area) according to EN 55022A/B, EN 55011 A/B and EN 50081-1/2 and, concerning the interference sensibility, classification A (industrial area) according to EN 50082-2.

4.5 Technical Specifications

CPU	Echelon Neuron 3150,10MHz	
Memory	64Kbytes Flash memory, 512Bytes EEPROM,2Kbytes SRAM,8Kbyte external SRAM	
LonWorks Transceiver	FT-X1	
Power supply	12~24VDC(24VDC is recommend)	
Power consumption	1.5w	
Connection	M2.5 screw (Pitch:3.5mm)	
Temperature	Operation	0 ~ +50
	Storage	-20 ~ +70
Admitted relative humidity	10 ~ 90%, non condensing	
Dimensions	60 x 94 x 30 mm,	
Mounting	Wall mounting	
Display & Operation	Service-pin and Reset LED indicator and button	
Max. connections	**8 wireless sensor devices**	
Max trans len	10 Meters	

Table 3.1 Technical Specification

4.6 Dimensions

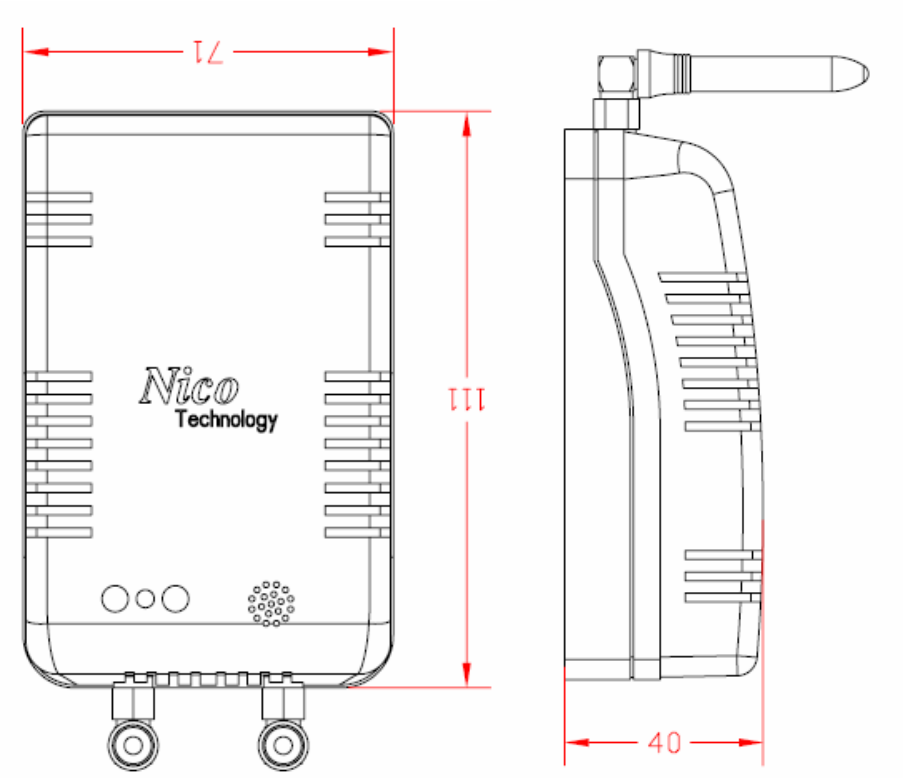


Figure 3.5 Device dimensions without plug-screw clamps

5 Application Software for ECOBINO

On the 7600RF RF Receiver an application for energy saving control is implemented, making output functionality as well as switch control functions available.
Therefore the relevant LonMark profiles stated in Table 4.1 are implemented. The use of network variables (NV) compiles with the LonMark standard, no customized network variables are used. SCPT's are used for parameterization by applying the read/write-memory method.

Title	Present Version	Identification
LonMark Application Layer Interoperability Guidelines	V3.1	078-0120-01D
The SNVT Master List and Programmer's Guide	V 8.0	
The SCPT Master List	V 8.0	
Sensor Object		

Table 4.1 Referring document about LonMark profiles

5.1 System Scope

The 7600RF RF Receiver is equipped between Wireless and LonWorks channels.
Each Wireless network allows then connection eight wireless sensors. Sensor Object according to LonMark Standard can be assigned to these output and configured.
Furthermore the 7600RF RF Receiver can act as constant sensor controller. The sensor received value from wireless sensor generated by the internal via an output network variable.

The 7600RF RF Receiver is equipped with one LonWorks communication circuit to connect LonWorks network.

5.2 Interoperable Interface

The LonMark profile *1040,1050,1010* are realized in the 7600RF RF Receiver. As some customized NVs are used, the network interface remains standardized, clear and especially it is interoperable. That means, the 7600RF RF Receiver can be used in connection with network components by other manufactures. The following table contains a survey of the network variables defining the 7600RF RF Receiver network interface and their assignment.

NV Name	Type	Allocated Object
nvo_lux_val	SNVT_lux	Sensor Object
nvo_RH_val	SNVT_lev_percent	Sensor Object
nvo_temp_val	SNVT_temp_p	Sensor Object

Table 4.4 Allocation of NVs and LonMark objects

Under the order code 7600RF a data carrier containing the interface describing files ***ECOBINO_WG_P2.XIF*** and the applications ***ECOBINO_WG_P2.APB*** is provided free of charge at simultaneous purchase of ECOBINO system. The XIF-file is necessary for integration with LonMaker for Windows or any other LonWorks network management tool.

6 System Objects

This chapter describes the LonMark objects implemented in the 7600RF RF Receiver. For each it states the network variable les used, special configuration properties, general object properties, response during modification of the configuration and after a reset, and, if available, further object properties.

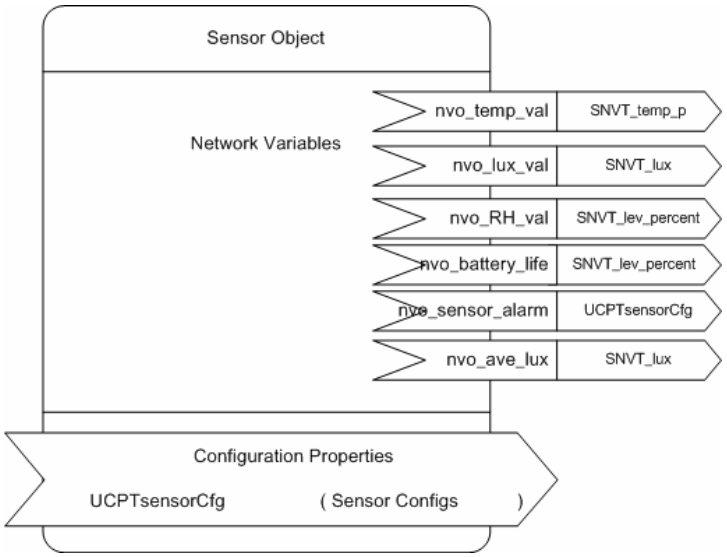
6.1 Node Object

The functionality of the node object is defined in the Application Layer Guidelines of LonMark Interoperability Association (www.lonmark.org).

Network Variables

NV Name	NV Type	Comment
nviRequest	SNVT_obj_request	Status request
nvoStatus	SNVT_obj_status	Status response
nvoAlarm	SNVT_alarm	Alarm generating
nvoFileDirectory	SNVT_address	Address of file for parameterization

6.2 Sensor Object



Network Variables

NV Name	NV Type	Comment
nvo_ave_lux	SNVT_lux	Average value of Lux Valid range:1~65535
nvo_battery_life	SNVT_lev_percent	Battery life information Valid ragne:0~100% (0,10,25,40,55,70,85,100%)
nvo_lux_val	SNVT_lux	Lux value
nvo_RH_val	SNVT_lev_percent	Humidity value Valid range:0~100
nvo_sensor_alarm	UNVT_sensor_alarm	Sensor Alarm
nvo_temp_val	SNVT_temp_p	Temperature value Valid range:-50~70

Configuration Properties

CP Name	Comment
error_count	Define how many "No data" error occurs then send the "Sensor Dead" alarm Default value:6 Valid range: 1~100 When "No data" received within 30 second then error_count +1. When current error count equal then error_count cp value and then send the "Sensor Dead"

	alarm. When any signal is received, reset the error_count
invalid_count	Define how many "Invalid data" error occurs then send the "Invalid data" alarm Default value: 6 Valid range: 1~100 When "Invalid" or "No data" errors received within 30 secs, then invald_count+1. When "valid data" is received, reset invalid count. When current invalid count equals to invalid count cp value and then send the "Invalid data" alarm of the sensor.
buffer_size	Define totally of buffer_size. (max: 100) Default value:100 Valid scope: 1~100
average_calculate_time	For average lux values calculate.(Minute) default value: 10.(30 samples) Every 20 seconds collect a sample from nvolux_value Valid scope: 10~255 If samples of buffer not enough then sum all the value of current sample to division number of sample. Ex. Current number of samples: 6 (Value_1 + Value_2 + Value_3 + Value_4 + Value_5 + Value_6) / 6 = **nvo_ave_lux**
modification.mod0	Ref. Lux Modification(must change to 1) Valid range: -1638.4 ~ 1638.3
modification.mod1	Ref. Lux Modification(must change to 1) Valid range: IEEE 754
modification.mod2	Ref. Lux Modification Valid range: IEEE 754
modification.dis	Lux modification's distinction Valid range: 0 ~ 65535
power_up_value	Default output value for power up sensor gateway. Before receive first time value of

	sensor. Valid range: -32768 ~ 32767 ***[Attention] Do not use copy or dump function within LM4W when configure functional block. That can get automatic generate a correct default value, invalid high value, invalid low value, alarm high value and alarm low value.***
dead_state_value	Output value of sensor dead alarm occurs. Valid range: -32768 ~ 32767
invalid_state_value	Output value of sensor invalid data alarm occurs. Valid range: -32768 ~ 32767
valid_high_limit	Define valid value of scope. (Max) Valid range: -32768 ~ 32767
value_low_limit	Define valid value of scope. (Min) Valid range: -32768 ~ 32767
alarm_high_limit	Define alarm value of scope (Max) Valid range: -32768 ~ 32767
alarm_low_limit	Define alarm value of scope (Min) Valid range: -32768 ~ 32767

6.3 Default CP Value of Sensor Object

CP Name	Lux	Room Temp	Room Humidity	Freezer
error_count	**6**	**6**	**6**	**6**
invalid_count	**6**	**6**	**6**	**6**
buffer_size	**100**	**100**	**100**	**100**
average_calculate_time	**10**	**10**	**10**	**10**
modification.mod0	**0**	**0**	**0**	**0**
modification.mod1	***1***	***1***	***1***	***1***
modification.mod2	**0**	**0**	**0**	**0**
modification.dis	**0**	**0**	**0**	**0**
power_up_value	***1***	***20***	***50***	***0***
dead_state_value	**0**	**0**	**0**	**0**
invalid_state_value	**0**	**0**	**0**	**0**
valid_high_limit	**30000**	**100**	**99**	**100**
value_low_limit	**0**	**0**	**0**	**-40**
alarm_high_limit	**30000**	**100**	**95**	**25**
alarm_low_limit	**1**	**0**	**0**	**-25**

6.4 Battery life measure

Battery Life	Detect voltage
0%	**<3**
10%	**3 ~ 3.25**
25%	**3.25 ~ 3.5**
40%	**3.5 ~ 3.75**
55%	**3.7 5~ 4**
70%	**4 ~ 4.25**
85%	**4.25 ~ 4.5**
100%	**>4.5**

6.5 DIP Switch Setting

DIP Switch overview

there are two kinds of DIP Switch for 7600RF Receiver and 7xxxRF serial Sensors. On 7600RF Receiver have 5 DIP switch for configure setting Wireless network ID.

On 7xxxRF serial Sensors have 5 DIP switch for configure setting Wireless network ID (NET ID) and Sensor devices (Sensor ID)

In order to wireless devices can working correct, you have to configure correct **NET ID** on Sensor devices and 7600RF devices.

6.5.1 DIP Switch for ON 7xxxRF Sensor devices

The DIP Switch is setting by binary and each 7600RF RF Receiver have to configure as unique "Network ID". The valid channel id was between 0 and 15.

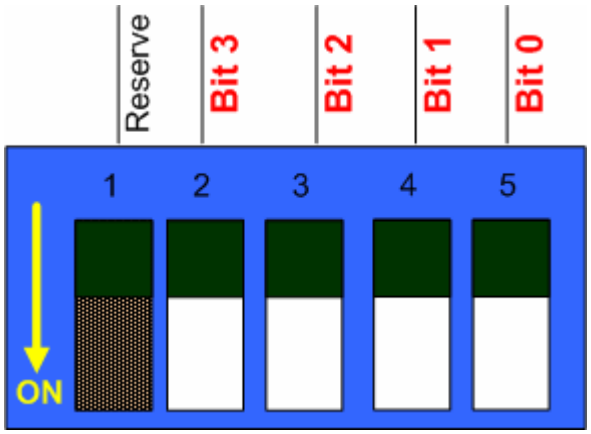


Figure 6.1 Identify DIP Switch for 7600RF RF Receiver Wireless network ID

6.5.2 Wireless network Channel ID Setting

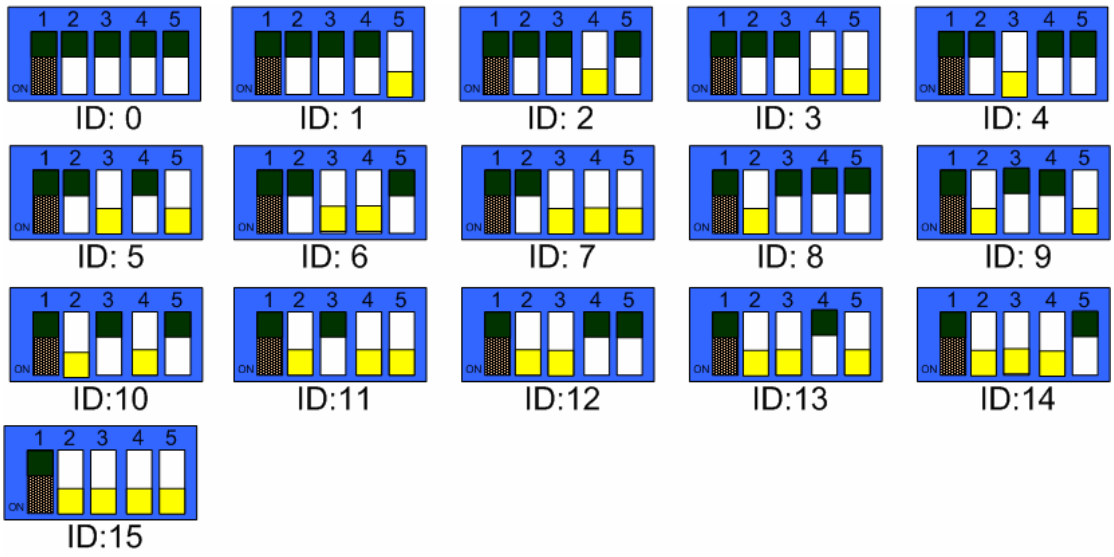


Figure 6.2 DIP Switch for Wireless network ID on 7600RF RF Receiver

7 Wireless Sensor ID Setting

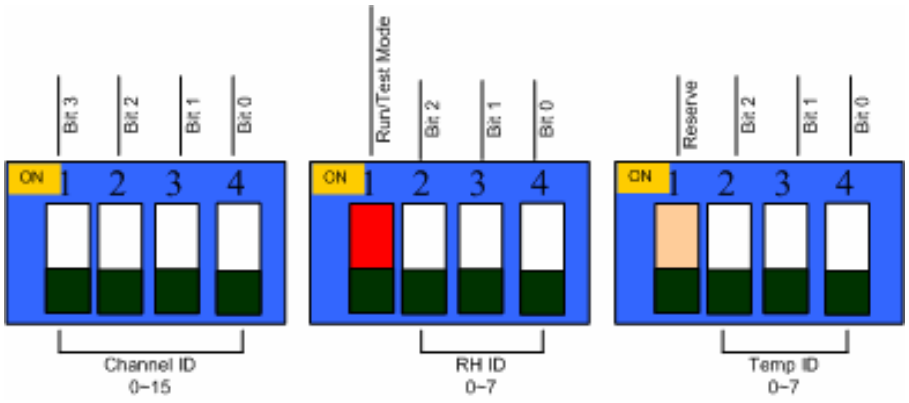


Figure 7.1 DIP Switch for 7002RF Temperature & Humidify Sensor ID

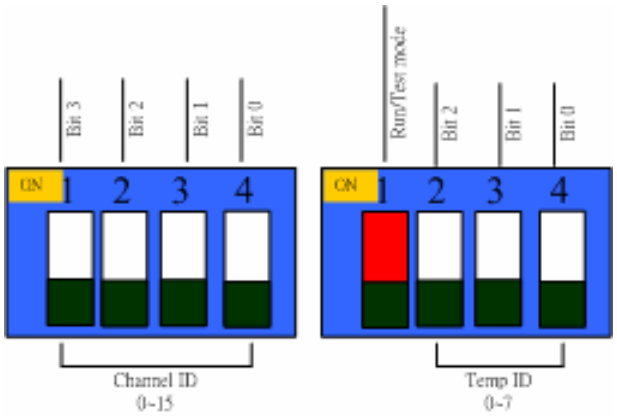


Figure 7.2 DIP Switch for 7001RF Freezer Temperature Sensor ID

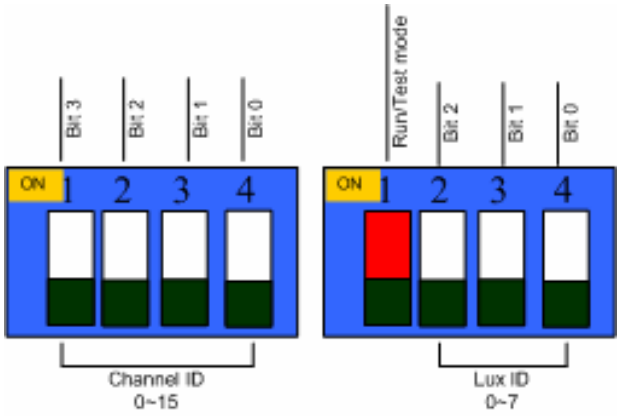


Figure 7.3 DIP Switch for 7200RF Lux Sensor ID

8 Wireless Frequency scope and PN code

Channel ID	Primary Channel	Second Channel	PN Code
0	2400 MHz	2440 MHz	0x83,0xF7,0xA8,0x2D,0x7A,0x44,0x64,0xD3
1	2404 MHz	2444 MHz	0x40,0xBA,0x97,0xD5,0x86,0x4F,0xCC,0xD1
2	2409 MHz	2449 MHz	0x3F,0x2C,0x4E,0xAA,0x71,0x48,0x7A,0xC9
3	2414 MHz	2454 MHz	0x17,0xFF,0x9E,0x21,0x36,0x90,0xC7,0x82
4	2419 MHz	2459 MHz	0xA6,0x46,0xB5,0x9A,0x3A,0x30,0xB6,0xAD
5	2424 MHz	2464 MHz	0xBC,0x5D,0x9A,0x5B,0xEE,0x7F,0x42,0xEB
6	2429 MHz	2469 MHz	0x24,0xF5,0xDD,0xF8,0x7A,0x77,0x74,0xE7
7	2434 MHz	2474 MHz	0x3D,0x70,0x7C,0x94,0xDC,0x84,0xAD,0x95
8	2400 MHz	2440 MHz	0x40,0xBA,0x97,0xD5,0x86,0x4F,0xCC,0xD1
9	2404 MHz	2444 MHz	0x3F,0x2C,0x4E,0xAA,0x71,0x48,0x7A,0xC9
10	2409 MHz	2449 MHz	0x17,0xFF,0x9E,0x21,0x36,0x90,0xC7,0x82
11	2414 MHz	2454 MHz	0xA6,0x46,0xB5,0x9A,0x3A,0x30,0xB6,0xAD
12	2419 MHz	2459 MHz	0xBC,0x5D,0x9A,0x5B,0xEE,0x7F,0x42,0xEB
13	2424 MHz	2464 MHz	0x24,0xF5,0xDD,0xF8,0x7A,0x77,0x74,0xE7
14	2429 MHz	2469 MHz	0x3D,0x70,0x7C,0x94,0xDC,0x84,0xAD,0x95
15	2434 MHz	2474 MHz	0x1E,0x6A,0xF0,0x37,0x52,0x7B,0x11,0xD4

PN code is for separate channel which is use same wireless frequency channel.

Channel 0~7 and 8~15 were use same radio frequency, but there have different PN code for separate channel identify even there are use same frequency for wireless transmission. Only correct frequency setting and PN code then wireless sensor could be communication with receiver.