RxWIMOD Communication Protocol

Because the complex communication protocol with the **WiMOD** Load Cell, **AEP transducers** has create a module, **RxWIMOD,** that simplify for a host device the job to communicate to it.

RxWIMOD is a point to point bridge between an host communication device and a **WiMOD** Load Cell by a standard RS232 or USB port (The USB Port is seen by the PC as a virtual RS232 port)

The **host device** can communicate to **RxWIMOD** with just some text commands.

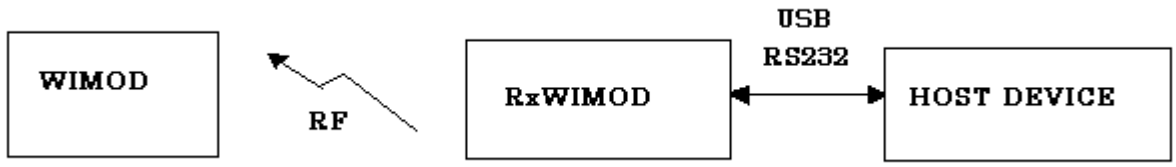
It will be a **RxWIMOD** job to translate this commands to the **WiMOD** protocol

By this commands you can set **RXWIMOD** to transmit the load value in continuously or just when you require the data and set all the relevant **WIMOD** parameters.

As a factory set **RxWIMOD** can communicate only with the **WiMOD** Load Cell assigned.

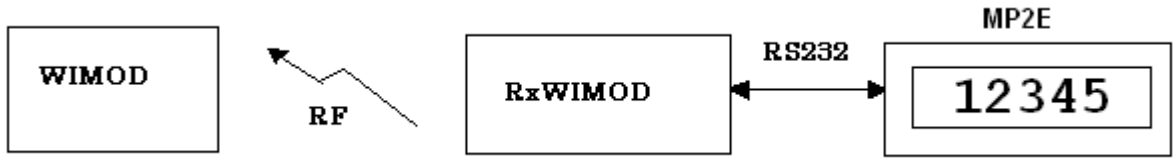
You can change the **WIMOD** assigned through special protocol (documented in the last page)

You can understand better the RxWIMOD job by the picture below



RxWIMOD can be directly interfaced with AEP MP2E instrument.

When put in Repeat Mode the MP2E can be used as display for WIMOD



STANDARD COMMUNICATION PROTOCOL

The standard RxWIMOD communication protocol is a very easy half-duplex protocol.

The host device sends command to RxWIMOD to set some parameters or just to read values and receive an answer .

The baud rate for this protocol is **19200** with no parity , 8 bit and 1 stop bit .

Note

If the RxWIMOD is set in CONTINUOUS transmittion mode (see the relevant paragraph) the baud rate is 115200.

The command and the answer messages are in text mode so you can use any serial terminal to establish a communication.

To any commands sent from the Host Device is forecasted an answer in which you can control if your commands have been correctly interpreted by the RxWIMOD.

There are 2 type of answer : **Status Message** and **Value Message**

The **Value Message** is sent only with the 'p000000CR' (Send Last Load Value) command (see command table)

In all other case a **Status Message** is sent.

If the Host Device does not receive an answer in 300ms means the RxWIMOD has received a wrong message or has not received any data at all. The command must be repeated.

If you set the RxWIMOD in CONTINUOUS Transmittion mode (with the command p7000yxCR) and you don't send commands for more than 10s the RxWIMOD baud rate is automatically switched to 115200

For a list of command see the relevant table. All commands message have the following format:

pXYYYYYcr 8 characters

where

p	: message header	: character 'p' : ASCII value 70H
X	: command identifier	: ASCII from '0' to '7'
YYYYY	: command parameters	: numeric values in ASCII '0' to '9'
cr	**:**message terminator	: 13 decimal (0DH Hex)

Status Message

This message is sent from the **RxWIMOD** as answer to any commands unless the ‘p000000CR’ (Send Last Load Value) command

The message is composed by 32 characters with different fields. Each field is separated from the other by a space ‘ ‘

AHHHHyCXyPXyTXXyUXyZXyHXyFXXyMXcr

Where the character **y** means space ‘ ‘ separator between fields while **cr** means ASCII Carriage Return (value 13 decimal – 0D hex)

AHHHH : A = field Header for Address field

HHHH WIMOD address (factory set from AEP)

HHHH can be both numeric and alphanumeric

CX : C= field Header for the Communication Field

X : 1 : communication with WIMOD active

0 : communication with WIMOD is not active

PX :P= field Header for RF Power Level

Set the **WIMOD** RF power

X 0 : power Level -10dbm

1: power level -2dbm

2: power level +6dbm

3: power level +10dbm

TXX :T= field Header for the TxRate field. :**Default value 10.**

This set the **WIMOD** to transmit a value every XX time

XX : value from 1 to 50 . Time unit .1s

UX :U= field Header for the Unit field. : **Defaut value is 0**

X=0 : Newton X=1: kg X=2 kN X=3 daN X=4 t X=5 lbf

ZX :Z= field Header for the Zero ON/OFF command

: X = 0 - Zero OFF X=1 – Zero ON

HX : H= field Header for the PROG MODE status

: X=0 - standard modeX=1 – RxWIMOD in PROG Mode

FXX : F = field Header for the Filter value : Default is 0

XX = filter value from 0..30

MX :M = Field Header for the mode status : Default is 0

X= 0 standard Mode X=1 continuous mode

Value Message

The Value Message is sent by the **RxWIMOD** as answer to the 'p000000CR' (Send Last Load Value) command and reflects the last valid data received from the **WIMOD**

The message length is 22 characters

SXXXXXXXXXXXXXyUyZyLBcr

Where the character **y** means a space ' ' between fields while **cr** means ASCII Carriage Return (value 13 decimal – 0D hex)

S	: 1 character :	sign + or –
XXXXXXXXXXXXX	: 13 characters :	numeric load value with decimal point
		the decimal point position depends on the Unit and from the Load Cell.
		If this field is filled with 'H' means WIMOD is overloaded in compression mode
		If this field is filled with 'L' means WIMOD is overloaded in tensile mode
		If this field is filled with 'I' means there is no communication between WIMOD and RxWIMOD and the data is not valid
U	: 1 character :	Load Unit
		0: kg 1 : Newton 2: kN 3:daN 4:t 5:lbf
Z	:1 character	: Zero On/Zero Off
		If present Z in this position means the load valued is zeroed
		If not present there is a space ' '
LB	:2 character	: Low Battery condition
		If present 'LB' in this position means the WIMOD battery is discharged and need to be recharged
		If not present there are two spaces ' '

NOTE

In the Value Message the ‘Z’ field reflects the WIMOD setting.

In the Status Message the Zero Field reflects the setting in the RxWIMOD unit.

If you send commands to change the Zero On/Off to the RxWIMOD, the relevant field inside the Status message is immediately updated but it takes some times before it will be transmitted to the WIMOD (according the TXRate of the WIMOD load Cell) .

So these field can be temporarily different in the Status Message and in the Value Message.

This value can be different until the RxWIMOD has not correctly transferred the command to the WIMOD.

CONTINUOUS Transmission mode

When set in **CONTINUOUS** Transmission mode (see the p7000yxCR command) **, RxWIMOD** transmit automatically a value every time it receives a load data from the WIMOD connected.

The baud rate for this protocol is fixed to **115200** with no parity , 8 bit and 1 stop bit

The message format is

$00SNNNNNNyUUUcr : 15 characters

Where

$00 : message header 3 characters

S : sign +/- 1 character

NNNNNN : numeric load value 6 characters

The format of this value reflects the decimal point position set with the relevant command (see command P7000yxCR)

In case of no decimal point last character N is a space ' '

In case of low battery condition from time to time the message "L.BATT" is present in this field

y : space ' '

UUU : Load UNIT 3 characters

: 'N ' or 'kg ' or 'kN ' or 'daN' or 't ' or 'lbf' (see command p30000yCR)

cr : message terminator 1 character

means the Carriage Return Character :13 decimal (0D HEX)

When set in this mode **RxWIMOD** can still receive standard commands but at the baud rate of 115200.

When **RxWIMOD** receives a command it stops to send continuous data and enter in standard mode .

After 10seconds without receiving any data from the host device, and if still set in this mode , the continuous transmission restart.

NOTE

If 'NNNNNN' = 'HHHHHH' then Load Cell is in overload in compression mode

If 'NNNNNN' = 'LLLLLL' then Load Cell is in overload in tensile mode

If NNNNNN' = 'L.BATT' WIMOD is in Low battery condition

Commands	Meaning	Parameter	Note
p000000CR	Send Last Load Value		
p10000yCR	Set Tara On/Off	y=1 Tara On y=0 Tara Off	
p2000yyCR	Set WiMOD transmission Rate	y= 1..50	Define the time between 2 WiMOD Transmission. Time in .1s unit
p30000yCR	Set Load Unit	y=0..5	0➔ kg 1➔ Newton 2➔kN 3➔daN 4➔t 5➔lbf
p40000yCR	Set WiMOD RF Power Level	y=0..3	0➔ -10dbm 1➔-2dbm 2➔+6dbm 3➔+10dbm
p50000yCR	Ask the RxWiMOD actual setting		You can use the RxWiMOD setup without set any parameter
p6000yyCR	Set the WIMOD Filter	y=0..30	0 means the lowest filter 30 the highest
p7000yxCR	Set/Reset the RxWiMOD continuous transmission mode. In OFF mode the load value is received after the p000000CR command	x=0-1 : 0=OFF 1=ON y=0..4 load numeric format	Y=0 format: 000000 Y=1 format : 0000.0 Y=2 format : 000.00 Y=3 format : 00.000 Y=4 format : 0.0000

Note: CR means the Carriage Return Character :13 decimal (0D Hex)

Protect Protocol to change the WIMOD address

To change the address of the WIMOD has been create a special sequence you have to follow

1. Send the ENTER PROG mode command
2. Send the the new WIMOD address
3. Send the the QUIT PROG and SAVE mode command

Commands	Meaning	Parameter	Note
p:12345CR	ENTER PROG mode		
p;0HHHHCR	Set the WIMOD Address	HHHH : WIMOD address	HHHH can be both numeric or alphabetic characters
P?56789CR	QUIT PROG and SAVE mode		
p>54321CR	QUIT PROG without SAVE mode		

Note: CR means the Carriage Return Character :13 decimal (0D Hex)