



Users Manual

TECHEON Universal Remote Controller BFF01

2nd Generation

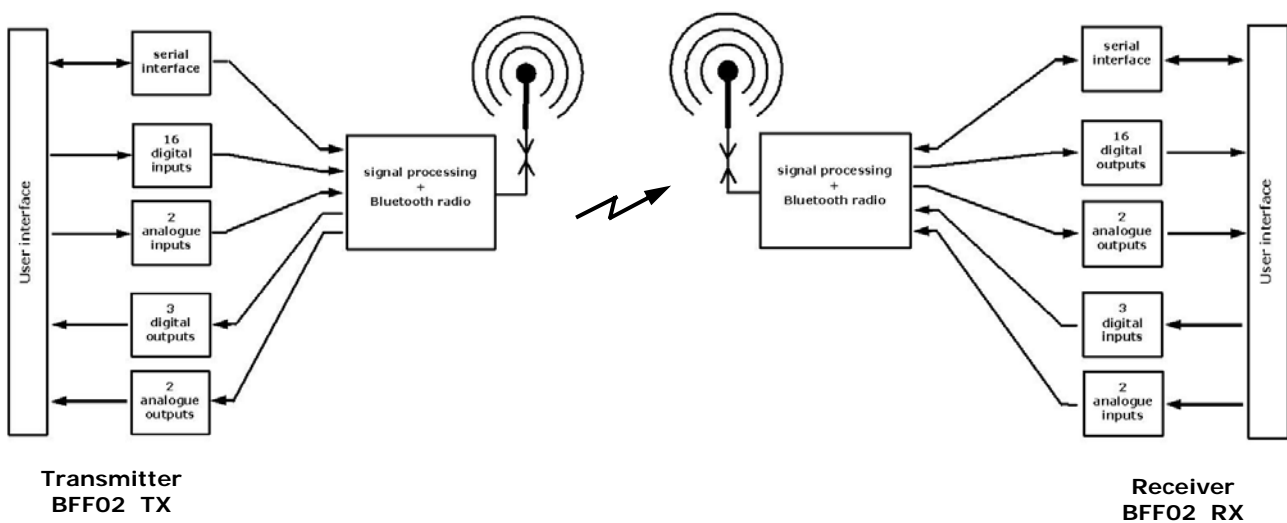


BFF02

BFF02

These universal remote control systems employ powerful Bluetooth radio components. A simultaneous application of digital- and analogue in- and outputs together with a full duplex serial interface is possible. The standard DIN rail housing can be easily mounted into your switch cabinet. It is very easy for the user to design a complete remote control for a various different applications by using these sophisticated devices. The BFF02 remote controller can not be adopted by third or other Bluetooth devices and offering a high grade of data security. Due to the application of 79 transmission channels in the frequency hopping mode with 1600 channel alternations per second, the systems securing a high grade of immunity against interferences. No influences by W-LAN devices according to IEEE 802.11b/g. The high radio frequency output power of +20dBm (100mWatts) is representing a good range performance, also. The units operate within the 2.4GHz ISM-Band, what means that those units can be used licence free and free of charge. All Bluetooth software stacks are already integrated and certified.

1. Block diagram:



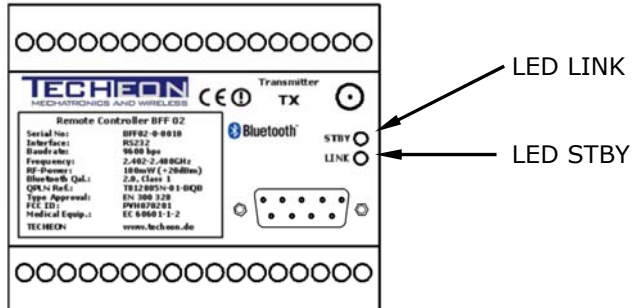
2. Installation

To get the highest possible performance of this system, the antenna respectively the unit must be mounted in an exposed position. Metal parts and reinforced concrete decrease the range of the system; high data rates, also. Electrical disturbances and other devices using carrier frequencies within the 2.4GHz ISM-Band can lead to block each other, in rare cases.

3. Power Supply

Ensure, that the power supply is uninterruptible and within the range of 15 to 30 Volts DC. A gap in the power supply leads to a loss of data. The power consumption depends on the data traffic. The maximum power consumption is approx. 1.5 Watts per device.

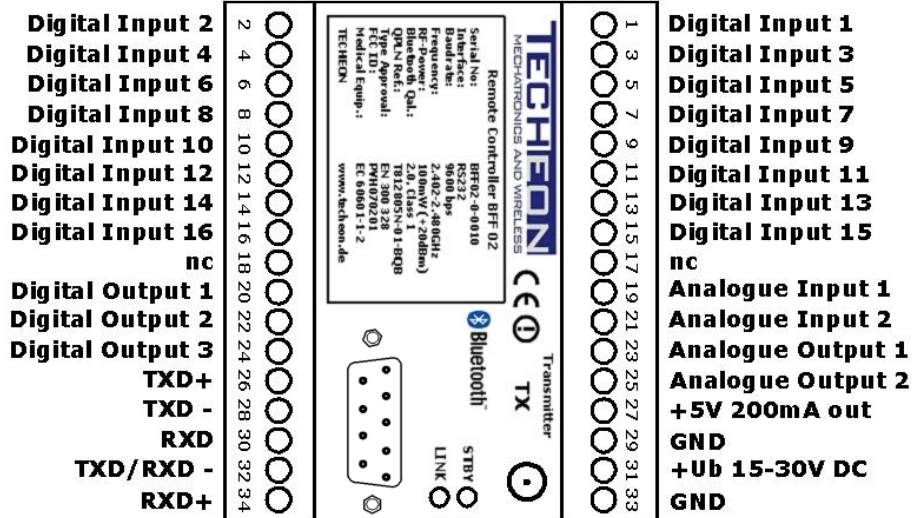
4. Synchronising



Right after supplying power, the units start to synchronise to each other. This process can take up to 30 seconds. During synchronising, the LED "LINK" shines red. After a successful synchronising, the LED "LINK" changes to green. If no subscriber is available, the unit changes into the standby modus, what is displayed by the orange coloured LED "STBY".

5. Pinnings

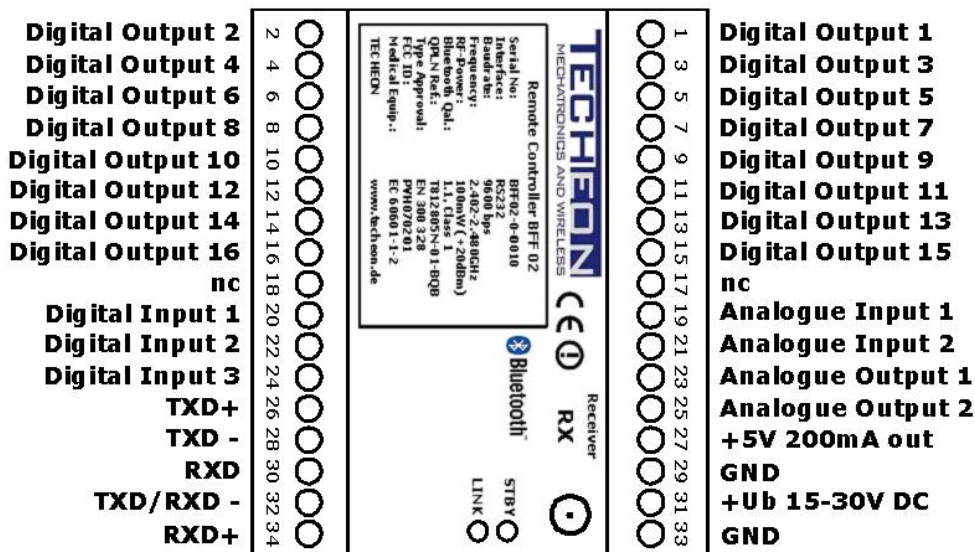
5.1 Transmitter:

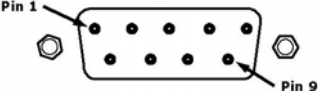


Pin #	BFF02-0 RS232	BFF02-1 RS422	BFF02-2 RS485	BFF02-3 TTY
Pin # 1		TXD+	A	TXD+
Pin # 2	RXD			
Pin # 3	TXD	RXD-		RXD-
Pin # 4				
Pin # 5	GND	GND	GND	GND
Pin # 6		TXD-	B	TXD-
Pin # 7				
Pin # 8		RXD+		RXD+
Pin # 9				

Terminal No.	Input / Output	Description
1	I	Digital Input 1
2	I	Digital Input 2
3	I	Digital Input 3
4	I	Digital Input 4
5	I	Digital Input 5
6	I	Digital Input 6
7	I	Digital Input 7
8	I	Digital Input 8
9	I	Digital Input 9
10	I	Digital Input 10
11	I	Digital Input 11
12	I	Digital Input 12
13	I	Digital Input 13
14	I	Digital Input 14
15	I	Digital Input 15
16	I	Digital Input 16
17	-	nc
18	-	nc
19	I	Analogue Input 1
20	O	Digital Output 1
21	I	Analogue Input 2
22	O	Digital Output 2
23	O	Analogue Output 1
24	O	Digital Output 3
25	O	Analogue Output 2
26	O	TXD+
27	Power	+5V 200mA out
28	O	TXD-
29	Power	GND
30	I	RXD
31	Power	+Ub
32	I/O	TXD/RXD-
33	Power	GND
34	I	RXD+

5.2 Receiver:



	BFF02-0 RS232	BFF02-1 RS422	BFF02-2 RS485	BFF02-3 TTY
Pin # 1		TXD+	A	TXD+
Pin # 2	RXD			
Pin # 3	TXD	RXD-		RXD-
Pin # 4				
Pin # 5	GND	GND	GND	GND
Pin # 6		TXD-	B	TXD-
Pin # 7				
Pin # 8		RXD+		RXD+
Pin # 9				

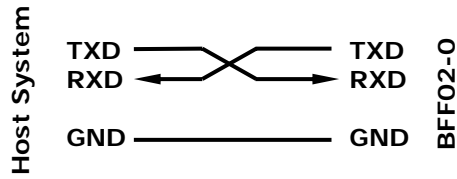
Terminal No.	Input / Output	Description
1	O	Digital Output 1
2	O	Digital Output 2
3	O	Digital Output 3
4	O	Digital Output 4
5	O	Digital Output 5
6	O	Digital Output 6
7	O	Digital Output 7
8	O	Digital Output 8
9	O	Digital Output 9
10	O	Digital Output 10
11	O	Digital Output 11
12	O	Digital Output 12
13	O	Digital Output 13
14	O	Digital Output 14
15	O	Digital Output 15
16	O	Digital Output 16
17	-	nc
18	-	nc
19	I	Analogue Input 1
20	I	Digital Input 1
21	I	Analogue Input 2
22	I	Digital Input 2
23	O	Analogue Output 1
24	I	Digital Input 3
25	O	Analogue Output 2
26	O	TXD+
27	Power	+5V 200mA out
28	O	TXD-
29	Power	GND
30	I	RXD
31	Power	+Ub 15 - 30V DC
32	I/O	TXD/RXD-
33	Power	GND
34	I	RXD+

5.3 Available models:

model	transmitter →		receiver	receiver ←		transmitter
	analogue channels	digital channels		analogue reverse channels	digital reverse channels	
BFF02-0	2	16	RS232	2	3	RS232
BFF02-1	2	16	RS422	2	3	RS422
BFF02-2	2	16	RS485	2	3	RS485
BFF02-3	2	16	TTY	2	3	TTY
BFF02-4	2	16	-	2	3	-

5.4 Serial interface wiring scheme:

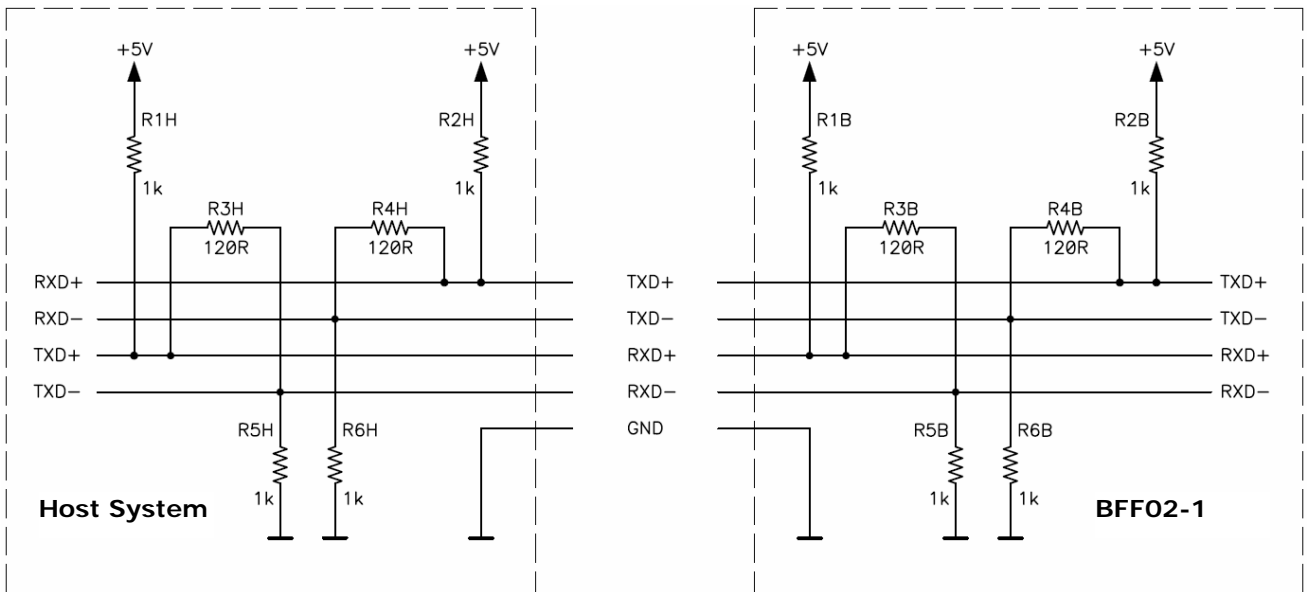
5.4.1 RS232:



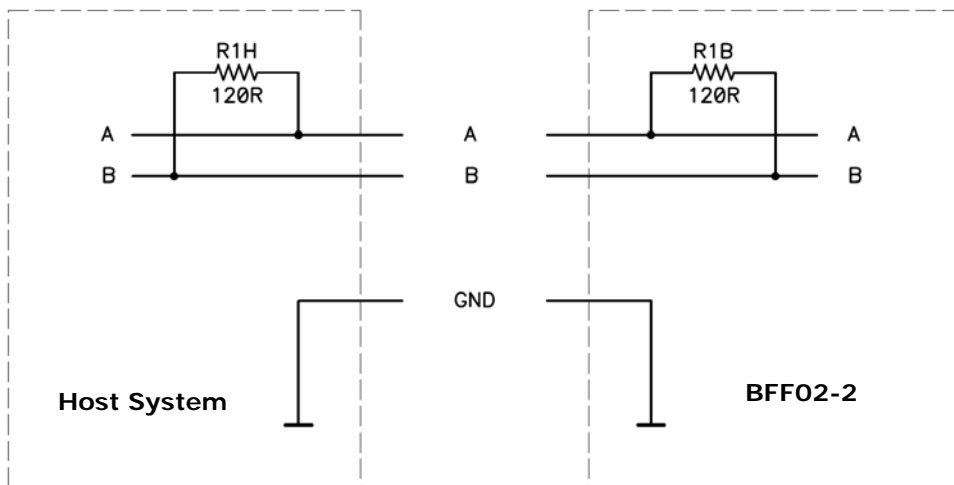
Output level: typical $\pm 9V$
 Input resistance: typical $5k\Omega$
 Output resistance: typical 300Ω

$V_{in_{lo}}$: typical 1,2V
 $V_{in_{hi}}$: typical 1,7V

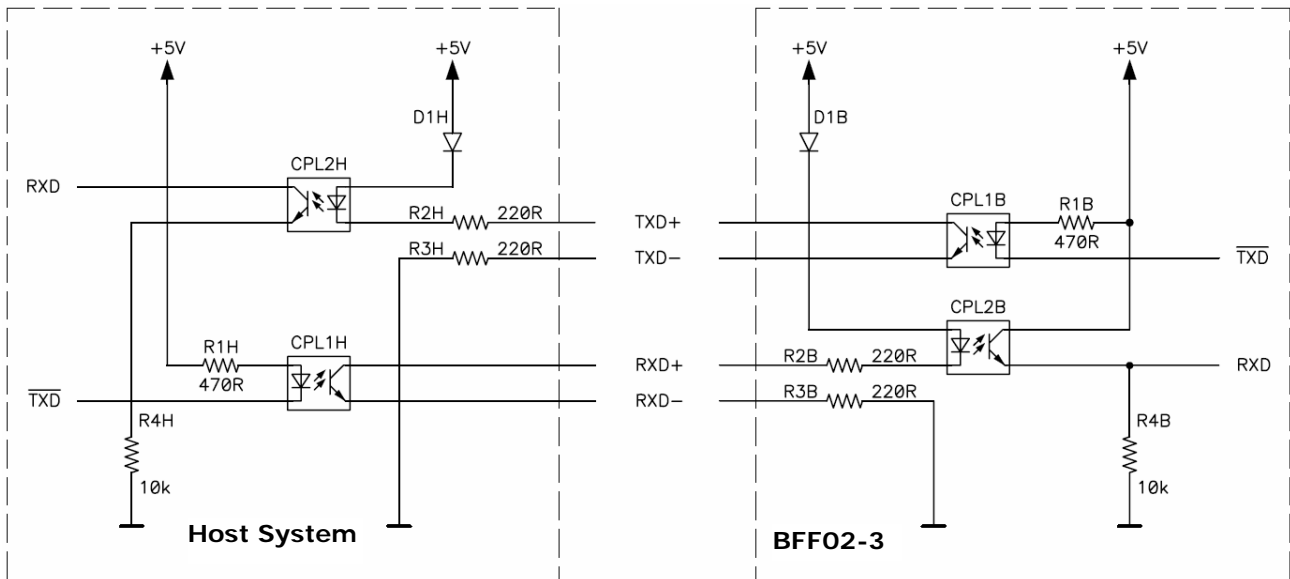
5.4.2 RS422:



5.4.3 RS485:



5.4.4 TTY:



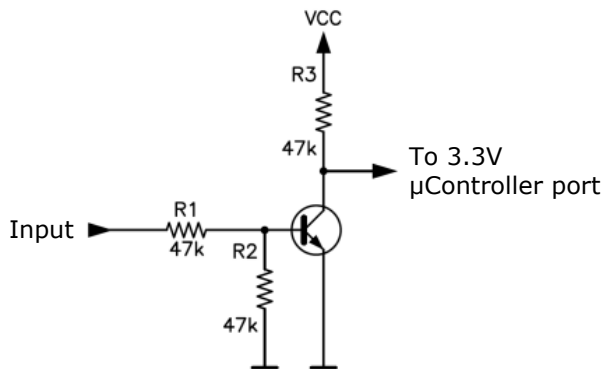
5.5 I/O's:

Digital inputs:

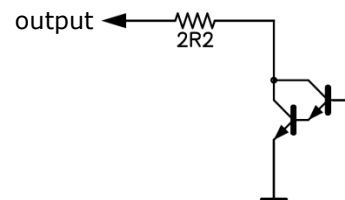
Level: 0 - 30V
 R_i : 47k Ω
 $V_{in_{lo}}$: typical 1.0V
 $V_{in_{hi}}$: typical 1.25V

Digital Outputs:

Level: open collector, max 40V
 V_{io} : typical 1.2V @ 100mA
 I_{max} per output: 200mA
 I_{max} all outputs: total max. 1,4A



Scheme of digital inputs



Scheme of digital outputs

Truth table:

Input (Transmitter)	Output (Receiver)
L	H
H	L

L = 0...1V
H = 1...3.5V

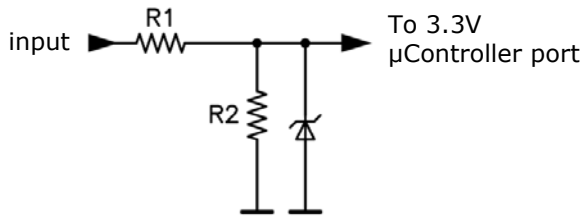
Analogue inputs:

Level: 0 - 10V
0...5V¹⁾
R_i: 100kΩ
Resolution A/D converter: 10 Bit

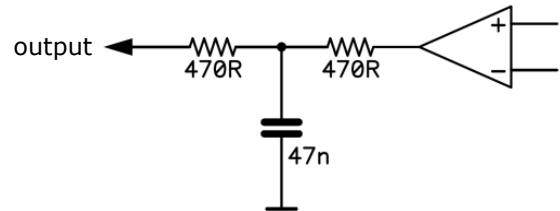
Analogue outputs:

Level: 0 - 10V
0...5V¹⁾
R_i: 1kΩ
Resolution D/A converter: 10 Bit

¹⁾ 0...5V, for models with option -A5



Scheme of analogue inputs

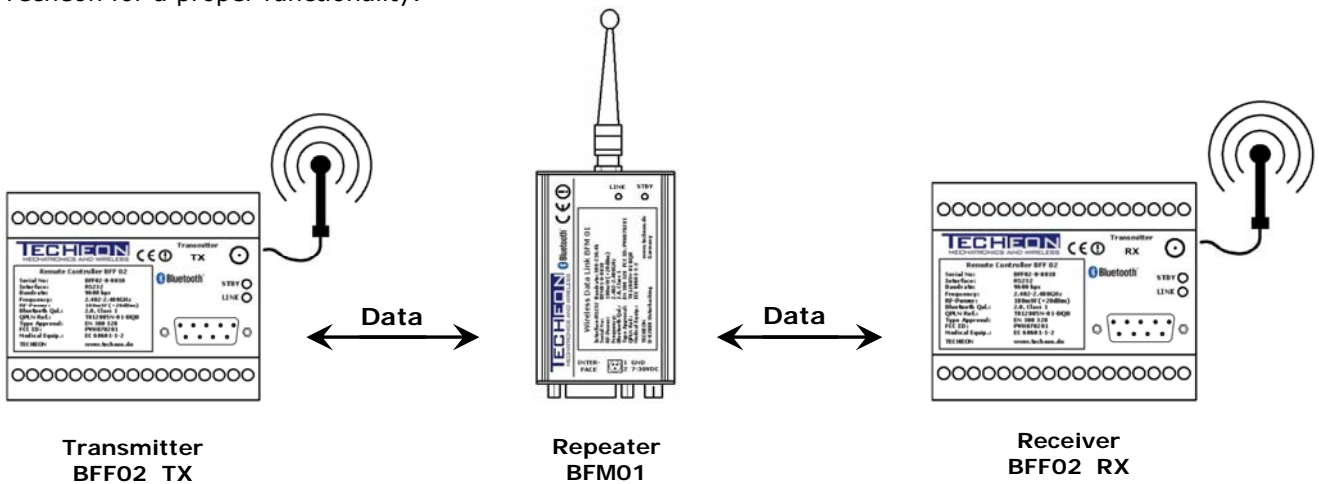


Scheme of analogue output

R1=68kΩ R2=30kΩ for 0...10V
R1=51kΩ R2=51kΩ for 0...5V (Option -A5)

6. Raising the transmission range by employing a repeater (BFM01):

The transmission range can be increased, by using a repeater (BFM01). The devices must be configured by Techeon for a proper functionality.



8. Technical Data:

Technology:	Bluetooth Class 1, Qualification 2.0
Frequency:	2,402 – 2,480GHz, ISM-Band
RF-Channels:	79
Alternations per second:	1600
Max. Range:	approx. 250 meters in line of sight; also depending on data rate 50–100 meters (approx. 150 – 300 ft) inside buildings. Depending on the wall construction
Protocol:	8 data bits, no parity, 1 stop bit transparent data mode
Data rate:	9600 bps
Handshake:	no handshake
Power consumption:	max. 1.5 Watts
Voltage supply:	15 - 35V DC, 8 – 35V DC for Models with Option –A5
Digital inputs:	0 - 30V DC; 47kΩ
Analogue inputs:	0 - 10V DC; 0 – 5V for Models with Option –A5 100kΩ; asymmetric; 10 bit A/D-converter resolution
Digital outputs:	open collector (npn); max. 200mA per output; max. 1.4A at all outputs together
Analogue outputs:	0 - 10V DC; 0 – 5V for Models with Option –A5 1kΩ, asymmetric; 10 bit D/A-converter resolution
Dimensions:	90 x 75.5 x 45.5mm / 3.54" x 2.97" x 1.79" (W x L x H), without connectors and antenna
Weight:	550grams, without antenna
Protection class:	IP50
Operating Temperature Range:	-25°C - +55°C (-13°F - +131°F)
Storage Temperature Range:	-30°C - +85°C (-22°F - +185°F)
Humidity:	5 – 90%, not condensing
Conformities:	EN 300 328-2 V1.1.1 EMC: EN 301 489 V1.3.1, EN 301 489 V17.1.1, EN 61000-6-2 Low Voltage Directive: EN 61131-2 Medical Electrical Equipment: IEC 60601-1-2
Type Approval:	ETS 300 328, ETS 300 826 FCC ID: PVH070201
Antenna with knee:	L = 100mm (3.94")
Puck antenna:	Ø = 70mm (2.76"); cable length = 3,00m (118")
Notice:	on basis of the type approval, it is strictly forbidden to use other antenna types as those types offered by Techeon Mechatronics And Wireless.
RoHS:	Our products are conform to RoHS
WEEE-Registration No:	DE 64490879

Ordering informations:

Remote Controller BFF02-0 with RS232 interface:	part No. 102.000.00
Remote Controller BFF02-1 with RS422 interface:	part No. 102.000.10
Remote Controller BFF02-2 with RS485 interface:	part No. 102.000.20
Remote Controller BFF02-3 with TTY interface:	part No. 102.000.30
Remote Controller BFF02-4 without serial Interface:	part No. 102.000.40
Remote Controller BFF02-0-A5* with RS232 interface:	part No. 102.000.50
Remote Controller BFF02-1-A5* with RS422 interface:	part No. 102.000.60
Remote Controller BFF02-2-A5* with RS485 interface:	part No. 102.000.70
Remote Controller BFF02-3-A5* with TTY interface:	part No. 102.000.80
Remote Controller BFF02-4-A5* without serial Interface:	part No. 102.000.90
$\lambda/2$ antenna (with knee, 100mm/3.94" length):	part No. 100.001.00
Puck antenna (\varnothing 70mm/2.76"):	part No. 100.002.00
Antenna extension cable; 1m/39.37" length; SMA connectors:	part No. 101.002.00

* Option -A5: Power Supply = 8 - 35V DC, Analog Inputs and Outputs = 0...5V



$\lambda/2$ -antenna with knee
length = 100mm/3.94"



Puck antenna \varnothing 70mm/2.76"
cable length = 3.00 meters/118"

Pictures are not true to scale

Technical changes reserved!

Release V13