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Description

bc-12er

The bc-12er is a 12 channel receiver designed for the brixlcontrol system. Supplying 12 universal channels, the bc-12er is the ideal unit for smaller models or trailers. Multiple units can be linked by either cable or infrared connections.

The 12 universal channels can be used as an output to drive servos, LED´s or PWM controlled drivers. Some of the channels can also be used as inputs to be connected with sensors for telemetry purposes or as inputs for switches.

Technical data bc-12er

Supply voltage	4V – 8V
Outputs (universal)	12
Maxmimum load (output)	20mA
Analogue input (switch)	max 4
PWM output	max 5
PWM output for bc-msII	max 2
Dimensions	22 x 34 x 12 mm

Ground -

Plus +

Signal

Connector for antenna
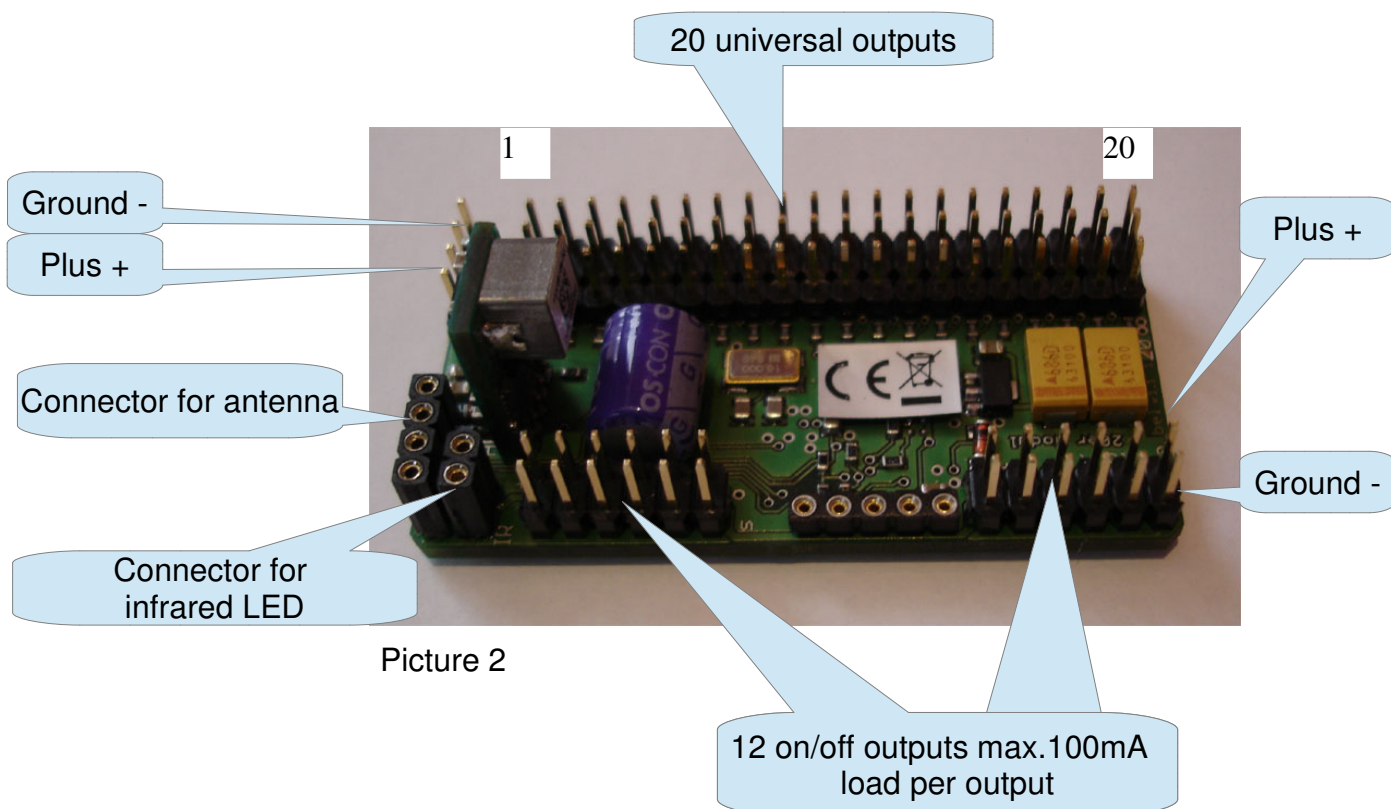
Picture 1
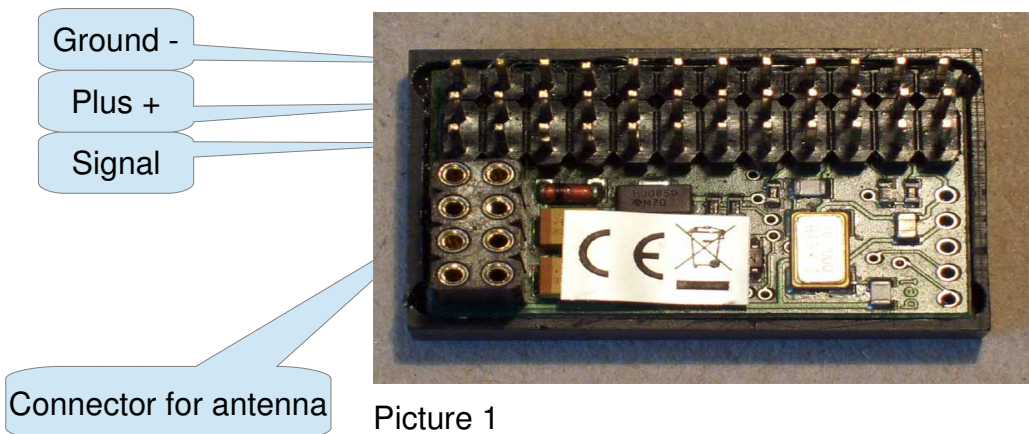
bc-20plus

The bc-20 plus is a 20 + 12 output receiver designed for the brixlcontrol system. This receiver is equipped with 20 universal channels that can be used as an output to drive servos, LED´s or PWM controlled drivers. Some of the channels can also be used as inputs to be connected with sensor for telemetry purposes or as inputs for switches. The bc-20 plus offers additional 12 outputs for on/off purposes with an internal driver for a maximum load of 100mA per output.

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Technical data bc-20 plus

Supply voltage	**Please refer to the remarks at the end of this document for information**
Outputs (universal)	20
Outputs on/off	12
Maxmimum load (universal output)	20mA
Analogue input (switch)	max 4
PWM output	max 5
PWM output for bc-msII	max 2
Dimensions	30 x 60 mm

20 universal outputs

Ground -

Plus +

Plus +

Connector for antenna

Ground -

Connector for infrared LED

1   20

12 on/off outputs max.100mA load per output

Picture 2

23.06.14 Vxx417

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bc-12er – 12 channel receiver   bc-20 plus 20 channel receiver

Please read and follow the hints and remarks on the last pages of this manual concerning mounting and power supply!

Functionality of outputs

Some of the universal outputs can be configured during the programming process as PWM outputs or inputs for sensors etc. Please refer to the shematics below for further details.

bc-12er

```
-----------------------------------------------------
| (G) (G) (G) (G) (G) (G) (G) (G) (G) (G)  (G)  (G)  |
| (V) (V) (V) (V) (V) (V) (V) (V) (V) (V)  (V)  (V)  |
| (S1)(S2)(S3)(S4)(S5)(S6)(S7)(S8)(S9)(S10)(S11)(S12) |
|  P   P   P   P   P   MP  M   M   M               DI  |
|                                                 ()|
| (O) ( )                                         ()|
| (I) ( )                                         ()|
| (V) (V)                                         ()|
| (G) (G)                                         ()|
-----------------------------------------------------
```

bc-20 plus

```
---------------------------------------------------------------------------------------
|(G)  (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G) (G)  |
|(G)  (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V) (V)  |
|(V+) (S1)(S2)(S3)(S4)(S5)(S6)(S7)(S8)(S9)(S10)(S11)(S12)(S13)(S14)(S15)(S16)(S17)(S18)(S19)(S20) |
|(V+)  M   M   M   MP  P   P   P   P   P           DI      P   PN  PN  N   N   N   N  |
|                                                                                     |
|                                               Led3                                  |
|                                                                                     |
|                                               Led2                                  |
| (0)                                           Led1                                  |
| (I)                                                                                 |
| (V)(V+)  (V+) (V+) (V+) (V+) (V+) (V+)                (V+) (V+) (V+) (V+) (V+) (V+)  |
| (G)(IR)  (S21)(S22)(S23)(S24)(S25)(S26)         ()()()()() (S27)(S28)(S29)(S30)(S31)(S32) |
---------------------------------------------------------------------------------------
```

G = GND

V = +5V (BEC)

V+ = Power supply for bc-20 plus (7,0 – 14V)

Sx = Universal output

M = Measuring input

P = PWM output

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bc-12er – 12 channel receiver   bc-20 plus 20 channel receiver

IR = IR LED connector with integrated resistor

I = IR sender or receiver

D = Display

N = Multiswitch/Nautic Module

LED1 = Status LED

LED2 = Eeprom/Memory access

LED3 = Operation indicator

Installation

The modules must be connected with an antenna and must be supplied with the supply voltage in the assigned range. Please refer to picture 1 and 2 for the correct connection.

(Remark: the coded wire of the antenna must face outwards)

The antenna code must have been programmed in the transmitter as per the instructions in the transmitter manual. Switch on the transmitter and the receiver and connect them as per the manual. Once the connection is established the blue LED on the tranmitter will light up and you can start programming the reciver.

Remarks

The texts and terms in the programming menues are german and can not be translated by now. This manual will use the german terms as they appear in the menues. The english translation willl appear in [brackets].

The term input device is used in the text for all devices on the transmitter that can be used to control the model. Upon delivery the transmitter might be equipped with different devices which can be individually configured. The standard configuration contains sticks, 3 position switches, 3 position momentary switches and rotating pots. An input device can be also connected to the receiver and act similar to the input devices on the transmitter.

The term output device is used for all actors in the model which are connected to the receiver. An output device can be a servo, ESC,PWM driver or an LED.

Operation status of the module

bc-12er

Upon delivery output 1 on the module is configured as a status output. A connected LED will show the different states of the module.

Permanent on = Connected to the transmitter

slow flash(long on/long off)= Module in programming mode

flash (long off/flash) = Module in park mode

quick flash (short off/flash)= Module in fail safe mode – connection lost

very long off/flash = Module powered up – check ok

Using the infrared connection this output will show the status of the ir-connection.

The status can be reprogrammed on any other output and can also be eliminated. The settings described below can only be performed if any of the outputs is defined as a status out put.

bc-20 plus

The bc-20 plus is equipped with a green LED onboard. This LED will show the status of the module.The flash codes are similar to the bc-12er. The settings described below can be changed on **output 33** wich is permanently assigned to the built in status LED.

Funktion: Status [Feature: Status]

With this feature you can assign a number to the the bc-12er module. This is required for cable linked modules for remote programming. This module number must be unique in one model and is only required for programming. In normal operation all linked modules will get the information sent out by the transmitter.

If you are operating more than one module this number **must** be assigned to each individual module. 0 should not be used as this is a general adress to access modules with unknown identifier. If you got a module with an unknown identifier the tranmitter can access this module with the adress 0. In this case connect just one module with an unnown identifier to an antenna and connect to the transmitter. With 0 this module can be accessed and reprogrammed.

To link bc-12er modules in one model the antenna must be connected parallel with a 4 wire cable to all modules. A y-connection cable (bc-ypsylon) is available to connect 2 modules.

Please note that the telemetric option will just work with module 1 !

This feature should only be used with tranmitters with a software version 1.500 and

higher. Transmitters with software versions below 1.500 can only access modules with identifier 0!

Moduladresse [Module identifier]	0..9	Define a unique identifier for this module Upon delivery all modules will come with 0
Min.Spannung [minimum voltage]	3.5..9.99	The BEC voltage will be monitored and this will define the minimum voltage. A voltage below the programmed value will trigger the alarm on the transmitter (bc-12er)
Min.Spannung [minimum voltage]	5.00..15.0	The BEC voltage will be monitored and this will define the minimum voltage. A voltage below the programmed value will trigger the alarm on the transmitter (bc-20 plus)
BSZ EIN mit [hour meter on]	A..z	The hour meter will be started with this input device while signal is <-10% and > 10%. `-` (below A) will reset the resetable hour meter
BEC/Wandler [BEC]	Ein bei Verb. [on if connected]	With this option the internal BEC system on the bc-20 plus will be switched off when the module is in park mode (saves energy while in park)
	Immer Ein [Always on]	BEC will remain always on. (Servos will hold load)
	Aus b.LoBat [Off if battery low]	BEC will be disabled if the programmed min voltage is reached

A second BEC system will supply the main processor on the module even if the BEC for the universal output is switched off.

Features

Funktion:Servo/Regler [Function:Servo/ESC]

Stick movement will be transmitted 1:1 from transmitter to receiver

Senderkanal [Input device]	A-z	Defines the input device of the tranmitter (Stick, switch, etc)
Einschaltwert [Default value power on]		Defines the position of the connected device when the module is powered up.
	Gemerkt [Memory]	Last position of the connected device before switched off
	kein Sig. [no signal]	No servo signal send to the connected device

	+/- 125%	Connected device will set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Ausschaltwert [switch off value]	Defines the position of the connected device during park mode (choosing and connecting to new model with transmitter)	
	halten [hold]	Current position will be held
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Funkabrisswert [fail safe]	Defines the position of the connected device when the signal is lost or the transmitter is switched off	
	halten [hold]	Current position will be held
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Wie begrenzen [limtation of signal]	ohne [without]	Feature disabled
	Endschalter [limit switch] Pos +-100	This output will be set to neutral from this positive value and higher
	Neg +-100	This output will be set to neutral from this negative value and below
50%Endsch	+100	Just -100%..0% can be used
	-100	Just 0%..100% can be used
	0	-100%..+100& can be used
	(to be used for limit switches)	
+100%	+100	-100%..+100% can be used
	0	-100%..0% can be used
	-50	-100%..-50% can be used
-100%	+50	+50%..+100% can be used
	0	0..+100% can be used
	-100	-100%..+100% can be used

AUS % AUS	0..125%		Using a potentiomer this can be used to switch of this output at a certain angle of the pot
Tempomat [Cruise control]			This will enable a cruise control option.

Choose an input device (momentary switch recommended) with „Begrenzung mit" that can control this feature. This feature will work similar to a „real" car cruise control. Using the switch with the throttle stick in any other position than 0 will store this position and you can release the throttle. The model will hold speed until you either clear the cruise control with the switch in opposite direction or with the throttle stick in a position higher than the stored one. Cruise control will be also stoped when moving the throttle stick in reverse direction. Using the switch with the model in stop and the throttle stick in neutral the porgrammed throttle position will be used and the model will run with the previously stored speed.

Begrenzung mit [limitation with]	A-z		Defines the input device that controls the limitation (input devices connected to the bc-12er can also control the limitation]
Ebeneschalter [Level control]	A-z		Defines the input device on the transmitter that enables/controls the different levels
Ebenenestellung [Level assignment]			Defines on which level this output will work (use 3 position switch for proper control of the levels)
	E+ 0+ A+		works on all levels
	E- 0- A+		works just in the upper level(switch up)
	E- 0+ A-		works just in the mid level(sw. Mid position)
	E+ 0- A-		works just in the lower level (switch down)
Gegenläufig [Reverse]	Nein [no]		Normal movement of connected device
	Ja/Invers [Yes/Reverse]		Reverse movement of connected device
	..+SigAus [..Signal off]		Signal will be switched of after 10 sec downtime (no change of position of input device)
Offset/Trim	-125%..+125%		Defines the offset of the connected device
Blindzone [Dead zone]	-95%..+95%		Defines the dead zone around the neutral position.
Expo wann [Expo. Start at]	5..95%		Defines the turning point of the exponential curve
Expo wie viel [Expo value]	5..95%		Defines the value at the turning point. E.g. Expo wann 10% and Expo wie viel 50% cause a 10% movement of the connected device at 50% of

the stick movement

MultiplikatorP [Multiplier positive]	0.2..2.00	Stick movement multiplied with MultiplikatorP is movement of the connected device(positive)
MultiplikatorM [MultiplierM]	0.2..2.00	Stick movement multiplied with MultiplikatorM is movement of the connected device(negative)
Maximalwert [max. value]	-100..125%	Maximum output value for the conncted device
Minimalwert [Min.value]	-125..100%	Minimum output value for the conncted device
Schnelligkeit [Speed]	0.01..100	Maximum speed of the signal change for the connected device. Controls servo/esc speed.
Übersteuern [overdrive]	A-z	Defines the input device for the overdrive option
Überst.Multi [overide multiplier]	-100..+100%	Defines the % of the overide option. The overide can be used in + or – direction and is defined as 0 when the module is powered up.
AusgangsSignal [Output signal]	Puls	Default setting for servos and esc
	PWM1	A 0-100% PWM signal will be provided on this output (to be used with bc-msII)
	PWM2	-100%..+100% PWM signal will be provide on this output (to be used with bc-msII)

Choosing PWM2 will also release the feature „PWM Erweitert" [PWM extended] which will only be uesd on the **bc-msII**. Please refer to the manual of the bc-msII for further details.

Funktion: Hydraulik [Feature: Hydraulic]

This feature will provide a hydraulic simulation with standard servos. The connected device (servo) will only move as long as the coresponding input device is moved. The connected device will stop when the input device is in neutral.

Senderkanal [Input device]	A-z	Defines the input device of the tranmitter (Stick, switch, etc)
Einschaltwert [Default value power on]		Defines the position of the connected device when the module is powered up.
	Gemerkt [Memory]	Last position of the connected device before switched off
	kein Sig. [no signal]	No servo signal send to the connected device

	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Ausschaltwert [switch off value]		Defines the position of the connected device during park mode(choosing and connecting to new model with transmitter)
	halten [hold]	Current position will be held
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Funkabrisswert [fail safe]		Defines the position of the connected device when the signal is lost or the transmitter is switched off
	halten [hold]	Current position will be held
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Ebenenschalter [Level control]	A-z	Defines the input device on the transmitter that enabled/controls the different levels
Ebenenestellung [Level assignment]		Defines on which level this output will work (use 3 position switch for proper control of the levels)
	E+ 0+ A+	works on all levels
	E- 0- A+	works just in the upper level(switch up)
	E- 0+ A-	works just in the mid level(sw. Mid position)
	E+ 0- A-	works just in the lower level (switch down)
Gegenläufig [Reverse]	Nein [no]	Normal movement of connected device
	Ja/Invers [Yes/Reverse]	Reverse movement of connected device
	..+SigAus [..Signal off]	Signal will be switched of after 10 sec downtime (no change of position of input device)
Offset/Trim	-125%..+125%	Defines the offest of the connected device
Blindzone [Dead zone]	-95%..+95%	Defines the dead zone around the neutral position.

23.06.14 Vxx417

Maximalwert [max. value]	-100..125%	Maximum output value for the conncted device
Minimalwert [Min.value]	-125..100%	Minimum output value for the conncted device
Auf.Geschw. [Speed up]	1..200	Maximum speed in up direction
Abw.Geschw. [Speed down]	1..200	Maximum speed in down direction

Please note that some connected devices may not accept high speeds.

Funktion: 3Gang Getriebe [Feature: 3 speed gear]

3 positions can be programmed to control a 3 speed gear with a 3 position switch

Senderkanal [Input device]	A-z	Defines the input device of the tranmitter (3 Position switch recommeded here)
Gang1 [Gear 1]	-125..+125	Defines the position in gear 1 (switch in down position)
Gang2 [Gear 2]	-125..+125	Defines the position in gear 2 (switch in mid position)
Gang3 [Gear 3]	-125..+125	Defines the position in gear 3 (switch in up position)

Funktion: 6Gang Getriebe [Feature: 6 speed gear]

6 positions can be programmed to control a 6 speed gear with a momentary switch.
Usage is sequential (similar to motorcycle gearboxes)

Senderkanal [Input device]	A-z	Defines the input device of the tranmitter 3 position momentary switch highly recommended
Einschaltwert [Default value power on]		Defines the position of the connected device when the module is powered up.
	Gemerkt [Memory]	Last position of the connected device before switched off
	1..6	Set position

Ausschaltwert		Defines the position of the connected device in park mode
	halten [hold]	Current position will be held
	1..6	Set position
Funkabrisswert [Fail safe]		Defines the position of the connected device when the signal is lost or the transmitter is switched off
	halten [hold]	Current position will be held
	1..6	Set position
G.Position 1..6 [Gear position]	-125..+125	Defines the 6 available positions for the connected device

Funktion: 6Gang erweitert [Feature: 6 speed gear extended]

This feature can be linked to the previous feature to add an additional output device. e.g. 2 servos can control one 6 speed gearbox.

Bezugskanal [linked, origin channel for the 6 speed gear]	1..12	6 speed gear is on out put 1..12.
G.Position 1..6 [Gear position]	-125..+125	Defines the 6 available positions for the linked connected device

Funktion: Raupe Links [Feature: Track mixer left]

With this feature you can control tracked models or models with one motor per side like a standard model. This is the feature for excavaors or dozer to be controled in the same way as you are used to control your truck. One stick controls forward/backward and one stick controls the direction.

Gaskanal A..z:a..z [motor control]		Defines the input device of the tranmitter (Stick, switch, etc) for the forward/backward movement
Einschaltwert [Default value power on]		Defines the position of the connected device when the module is powered up.
	Gemerkt [Memory]	Last position of the connected device before switched off
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position

23.06.14 Vxx417

	0	Neutral signal will be provided (1.5ms)
Ausschaltwert [switch off value]		Defines the position of the connected device during park mode (choosing and connecting to new model with transmitter)
	halten [hold]	Current position will be held
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Funkabrisswert [fail safe]		Defines the position of the connected device when the signal is lost or the transmitter is switched off
	halten [hold]	Current position will be held
	kein Sig. [no signal]	No servo signal send to the connected device
	+/- 125%	Connected device will be set to the programmed position
	0	Neutral signal will be provided (1.5ms)
Lenkkanal [direction]	A..z	Defines the input device of the transmitter (Stick, switch, etc) for the direction control
Lenkung Zugabe [steering increase]	-100..+100	defines the increase of speed of the outer track
Lenkung Abnahme [steering decrease]	-100..+100	defines the decrease of speed of the inner track
Ebeneschalter [Level control]	A-z	Defines the input device on the transmitter that enabled/controls the different levels
Ebenenestellung [Level assignment]		Defines on which level this output will work (use 3 position switch for proper control of the levels)
	E+ 0+ A+	works on all levels
	E- 0- A+	works just in the upper level(switch up)
	E- 0+ A-	works just in the mid level(sw. Mid position)
	E+ 0- A-	works just in the lower level (switch down)
Gegenläufig [Reverse]	Nein [no]	Normal movement of connected device
	Ja/Invers [Yes/Reverse]	Ireverse movement of connected device
	..+SigAus	Signal will be switched of after 10 sec downtime

[..Signal off]

Offset li [offset left]	-125%..+125%	Defines the offset of the connected device on the right side
Offset re [offset left]	-125%..+125%	Defines the offset of the connected device on the right side
Multip. li [Multiplier left]	0.2..2.00	Stick movement multiplied with Multip.li is movement of the connected device on the left side
Multip. re [Multiplier right] side	0.2..2.00	Stick movement multiplied with Multip.re is movement of the connected device on the right
Maximalwert [max. value]	-100..125%	Maximum output value for the conncted device
Minimalwert [Min.value]	-125..100%	Minimum output value for the conncted device
Schnelligkeit [Speed]	0.01..100	Maximum speed of the signal change for the connected device. Controls servo/esc speed.

Funktion: Raupe rechts [Feature: Track mixer right]

With this feature the second output for the track mixer will be defined

Raupe links ist [Track mixer left]	1..12	Track mixer left is defined on output ?
Gegenläufig [Reverse]	Nein [no]	Normal movement of connected device
	Ja/Invers [Yes/Reverse]	Reverse movement of connected device
	..+SigAus [..Signal off]	Signal will be switched of after 10 sec downtime (no change of position of input device)

Funktion: Nautic/Multiswitch [Feature: Nautic/Multiswitch]

Nautic or multiswitch modules compatible to the Robbe®/Futaba® standard can be controlled with this feature. (like GEWU® GMS16R, Beier Soundmodule, Wedico®)

GEWU®

Switch 1 A(up)   = Exit 1

Switch 1 E(down)   = Exit 2

Switch 2 A(up)   = Exit 3

Switch 2 E(down)   = Exit 4

USM-RC-2 Beier Soundmodule (please note sequence of the switches)

Switch 1 A(up)	= Switch 8 up
Switch 1 E(down)	= Switch 8 down
Switch 2 A(up)	= Switch 7 up
Switch 2 E(down)	= Switch 7 down.....

Schalter 1..8 [Switch]	A..z	Which input device shall be used „-" deactivated
Ebenenschalter [Level control]	A..z	Defines the input device on the transmitter that enables/controls the different levels
Ebenenestellung [Level assignment]		Defines on which level this output will work (use 3 position switch for proper control of the levels)

E+ 0+ A+	works on all levels
E- 0- A+	works just in the upper level(switch up)
E- 0+ A-	works just in the mid level(sw. Mid position)
E+ 0- A-	works just in the lower level (switch down)

Funktion: Licht/LED [Feature: Light/LED]

Senderkanal [Input device]	A-z	Defines the input device of the tranmitter (Stick, switch, etc)
Einschaltwert [Default value power on]		Defines the staus of the output when the module is powered up

Gemerkt [Memory]	Last status of the connected device before switched off
Ein [on]	Output is on (Hi 3.3V)
Aus [off]	Output is off (Lo 0V)

Ausschaltwert [switch off value]	Defines the status of the connected device during park mode

Gemerkt [Memory]	Last status of the connected device before switched off
Ein [on]	Output is on (Hi 3.3V)
Aus [off]	Output is off (Lo 0V)

Funkabrisswert [fail safe]		Defines the status of the output device when the signal is lost or the transmitter is switched off
	Gemerkt [Memory]	Last status of the connected device before switched off
	Ein [on]	Output is on (Hi 3.3V)
	Aus [off]	Output is off (Lo 0V)
Ebeneschalter [Level control]	A-z	Defines the input device on the transmitter that enabled/controls the different levels
Ebenenestellung [Level assignment]		Defines on which level this output will work (use 3 position switch for proper control of the levels)
	E+ 0+ A+	works on all levels
	E- 0- A+	works just in the upper level(switch up)
	E- 0+ A-	works just in the mid level(sw. Mid position)
	E+ 0- A-	works just in the lower level (switch down)
Gegenläufig [Reverse]	Nein [no]	Normal
	Ja/Invers [Yes/Reverse]	Feature inverted
Ausgabeart [Definition of switch]	EIN AUS %	Defines switching points for on and off if a stick or pot is used to control this output
	Memory Ein [Memory on]	Momentary switch moved to EIN (down) toggles output
	Memory Aus [Memory off]	Momentary switch moved to AUS (up) toggles output
	EIN 0 AUS [On 0 Off]	Switch position defines output
SchaltPunkt EIN [Switching point ON]	-100..+100	Defines stick/pot position for ON(do not use 50%)
Schaltpunkt AUS [Switching point OFF]	-100..+100	Defines stick/pot position for OFF(do not use 50%)
Bei Stellung AUS [Switch position up]	Aus/Ein [on/off]	Defines output in AUS (up) position of switch
Bei Stellung 0 [Switch mid position]	Aus/Ein [on/off]	Defines output in mid position of switch
Bei Stellung EIN [Switch position dowen]	Aus/Ein [on/off]	Defines output in EIN (down) position of switch

23.06.14 Vxx417

EIN Zeit/Nachlauf [On time]	Used with AUS/Zeit for flash options. If AUS Zeit/Pause is defined this option will set the on-time of the output. If AUS/Zeit is set to 0 this value will define the time the output will remain on after the input device is set to off.
	To simulate a double or triple flash (emergency vehicles) choose either 2Blitz or 3Blitz. These options will appear if values below 0 will be chosen. The time between the double or triple f lash will be defined with AUS/Zeit.
AUS Zeit/Pause [Off time/Pause]	Defines the OFF time in between flashes. 0 is permanent on.

Funktion: Blinker Links [Feature: Indicator Left]

This feature defines the settings for the output of an indicaor on the left side

Senderkanal A-z [Input device]	Defines the input device of the tranmitter (Stick, switch, etc.)	
Einschaltwert [Default value power on]	Defines the status of the output when the module is powered up	
	Warnbl. [Hazard lights]	Hazard lights (both indicators on)
	Links [Left]	Left indicator on
	Rechts [Right]	Right indicator on
	AUS [Off]	Both indicators off
Ausschaltwert [Switch off value]	Defines the status of the output when the module is in park mode	
	Warnbl. [Hazard lights]	Hazard lights (both indicators on)
	Links [Left]	Left indicator on
	Rechts [Right]	Right indicator on
	AUS [Off]	Both indicators off
Funkabrisswert	Defines the status of the output when the connection is	

23.06.14 Vxx417

[Fail safe value]		lost or the transmitter switch off
	Warnbl. [Hazard lights]	Hazard lights (both indicators on)
	Links [Left]	Left indicator on
	Rechts [Right]	Right indicator on
	Aus [Off[]	Both indicators off

Ebenenschalter [Level control] Ebenenestellung [Level assignment]	A-z	Defines the input device on the transmitter that enabled/controls the different levels Defines on which level this output will work
	(use 3 position switch for proper control of the levels)	
	E+ 0+ A+	works on all levels
	E- 0- A+	works just in the upper level(switch up)
	E- 0+ A-	works just in the mid level(sw. Mid position)
	E+ 0- A-	works just in the lower level (switch down)

| Gegenläufig [Reverse] | Nein [no] | Normal operation |
| | Ja/Invers [Yes/Reverse] | Reverse option (US indicator style) |

Lenkkanal(Sender) [Steering channel]	A..z	Defines the input device that stops the indicator. (Steering stick)
Ein Zeit [On time]	1..500	Defines the on-time of the indicator
Aus Zeit [Off time]	1..500	Defines the off-time of the indicator

Funktion: Blinker Rechts [Feature: Indicator Right]

This feature defines the output for the indicator on the right side

| Blink.links ist | 1..12 | Indicator left is on output? [Reqired to link both indicators) |

Funktion: Eingang Schalter/Signal [Feature: Input Switch/Signal]

A switch or a signal can be fed in the bc-12er. Depending on the voltage/signal on this input the modules can use this like an input from the transmitter. 0V will create -125% and voltages higher than 2V will create +125% on the assigned letter. n-z can be used on the same bc-12er module and n-x will be transmitted also to

modules wich are linked with infrared.

Please note that input voltages should not be higher than 3.3V. Add a 10k resistor for protection purposes.

If an open collector output (e.g. brake lights from ESC) is connected to these inputs, a pull up resistor of 5k to +BEC might be necessary.

Auf Kanal n-z [Channel n-z]	n..z	Which letter shall be assigned to this input?
Gegenläufig [Reverse]	NEIN [No]	0V -125% ..>2V +125%
	Ja/Invers [Yes/Reverse]	>2V -125% ..0V +125%

Funktion: Eingang Poti [Feature: Input Potentiometer]

A potentiometer can be connected to an input using **bc-MM-Poti**. The position of the pot will be read and can set any letter from n-z with a value between -125% and +125%. This letter can be used as an input for functions on the same moduel or can be transfered to linked module via infrared or cable connection.

The pot value must be between 2.2k and 10k and will be used as a voltage divider. 0V =125% and +3.3V = +125%

Auf Kanal n-z [Channel n-z]	n..z	Which letter shall be assigned to this input?

Please note:

Letters n-x will be transmitted via infrared to linked modules. Letters y and z will **not** be transmitted. This will allow the usage of y and z exclusively on the module where the coresponding sensor is connected. Please ensure the unique usage of the letters on linked modules!

Funktion: Eingang Messen [Feature: Measuring Input]

This feature is used for telemetric purposes and will send new measured values from the receiver to the transmitter every 400ms. Measured values can be also displayed on the **bc-disp** on board display. Please note that this feature requires a restart of the receiver after programming. Otherwise no data will be transmitted.

Messart	Spannung25 [Voltage25]	Voltage measurement using the **bc-MM-Sp** sensor with the measurement range of 0..25.0V
	Spannung50 [Voltage25]	Voltage measurement using the **bc-MM-Sp50** sensor with the measurement range of 0..50.0V
	Strom 10	Current measurement using the **bc-MM-St** sensor with

[Current 10]		the measurement range of 0..10A(15A peak). Sensor up to 50A upon request.
Temp.99		Temperature measurement using the **bc-MM-Temp** with the measurment range of 0..99.9°C
Temp.120		Temperature measurement using the **bc-MM-Temp** with the measurment range of -20..120°C
Poti [Pot]		Measurement of a potentiometer connected to a **bc-MM-Poti** with the range of -125% to +125%
Druck PY [Pressure PY]		Measurement of pressure using the **bc-MM-Dr-Pisello** sensor with the range of 0.0..34.0bar
Druck PMT [Pressure PMT]		Measurement of pressure using the **bc-MM-Dr-PMT** sensor with the range of 0.0..33.0bar
Druck Damitz [Pressure Damitz]		Measurement of pressure using the **bc-MM-Dr-Damitz** sensor with the range of 0.0..35.0bar. This sensor is designed to be mounted directly on the Damitz valves.
Druck bel [Pressure brixl]		Measurement of pressure using the **bc-MM-DR-brixlelektronik** sensor with the range of 0.0..35 bar. This sensor is equipped with a 3mm thread for universal connection

Please note that the range of the displayed pressure migh differ from the ranges printed on the sensors. This is system related and ha no effect on the display values.

Min.Alarm	0.0-100.0	If the measured value falls below this value an alarm is t riggered
Max.Alarm	0.0-100.0	If the measured value exceeds this value an alarm is triggered

An alarm will trigger the red LED on the transmitter and they start flashig. The tactile alarm (vibration) is triggered 2 times upon the start of an alarm and 1 time when the alarm condition will dissapear.

Funktion: IR-Sender [Feature: IR-Transmitter]

This fature can be enabled on output 12 on the bc-12er. The bc-20er is equipped with a dedicated output for an ir led with integrated resistor. All input devices will be transmitted except y and z.

Funktion: IR-Empfänger [Feature: IR Receiver]

This feature can be enabled on output 12 to connect the **bc-ir-emp** infrared receiever.

Please note that no infrared receiver should be connected during programming. For programming an antenna or a cable connection must be used.

Funktion: Display [Feature: Display]

A 0.9" display can be connected to output 12 to visualize different values. It will display the operating voltage and the values measured by connected sensors.

Senderkanal [Input device]	A-z	Defines the input device of the tranmitter that will change the display content. (swap between measuring values and hour meter). Momentary switch is recommended for this option.

Screen content measuring values:

```
brixlcontrol
[status]
[mv1]              [mv2]
[mv3]              [mv4]
Akku:       12.0V (bc-20 plus only]
BEC :       5.04V
```

[status] can be either:

[Spannung EIN]	Power supply on
[betrieb]	Connected to transmitter
[Empf.konfig]	Receiver in programming mode
[Funkabriss]	Connection lost, receiver in fail safe mode
[geparkt]	Receiver in park mode

[mv1..4]	Measuring values as defined in [Funktion: Eingang Messen] Feature: Measuring Input
Akku	voltage of power supply
BEC	voltage of BEC

Screen content hour meter:

```
brixlcontrol
[status]
Vers :      12417
EinZ :      12
BSZG       0:27
BSZ        0:23:15
```

[status] can be either:

[Spannung EIN]	Power supply on
[betrieb]	Connected to transmitter

	[Empf.konfig]	Receiver in programming mode
	[Funkabriss]	Connection lost, receiver in fail safe mode
	[geparkt]	Receiver in park mode
Vers		Version number of hard- (12) and software (417)
EinZ		Module has been started xx times
BSZG		Hourmeter total (HH:mm)
BSZ		Hourmeter depending on a defineable input device. (HH:mm:ss) Input device must be programmed in [Funktion: Status] Feature: Status. This allows to start and stop the hour meter with the same input device as a hydraulic pump to monitor operating hours. Hour meter values will be stored onboard upon status change or every 3 minutes.(resetable)

The flicker effect shown by the display is an intended effect to visualize the operation.

Funktion: Mischer [Feature: Mixer (only available in bc-20 plus)]

This feature offers up to 6 completely free programmable mixers (M1 to M6). The mixers can handle up to 8 different input devices.

Ausgang 1-32 [Output 1-32]	M1-M6	Chosse the mixer to be programmed.
MischerFunk [Mixer function]	Addierer [Addition]	All input devices will be added and send to Mx
	MaxWert [Max value]	The highest value will be sent to Mx
Mischkanal 1-8 [Number of input device for mix function]	1..8	This input device will be programmed now
Eingangssignal [Input device]	A..z+M1..M6	This input shall be used. Using M1..M6 will link mixers
Totzone Pos. [Dead zone positive]	0..95	Input device will not be used up to this value in positive direction
Totzone Neg. [Dead zone negative]	0..-95	Input device will not be used up to this value in negative direction
Multipli.Pos [Multiplier positive]	-200..+200	Multiplier for positive direction
Multipli.Neg [Multiplier negative]	-200..+200	Multiplier for negative direction

23.06.14 Vxx417

Remarks:

Antenna

> Never connect or disconnect the antenna while the receiver is powered up! This might destroy the modules. The colour coded cable of the antenna is facing away from the receiver!

Mounting

> Depending on the model and the available space for mounting the module can installed with or without the attached plastic cover. For this purpose we deliver both parts seperately. If the module is installed without the plastic cover ensure proper isolation. The module can be fixed in the plastic cover using 2 drops of hot glue.

Module adress

> If you are running linked module in a model, ensure a proper assignment of module numbers. Moule number 1 must be be assigned. This is the only module that can be used for telemetry purposes. Adress 0 must not be assigned to any of the modules!

> Running a single module adress 0 can be used. Moules will be delivered with this adress.

> Modules connected via infrared can not be programmed using this connection. To program a module which is intended to be used via infrared an antenna must be connected directly and the module adress must be 0. Once programming is done the antenna can be removed an the infrad red connection can be used.

> If you are using Servonaut or SGS equipment with multiple input lines (motor control and steering or additional functions) make sure that all inputs of these modules will be connected to either outputs 1-7, 8-14 or 15-20. Output signals will be send to these groups of outputs simultaniously and can cause problems when these groups will be mixed.

Power supply

> **The bc-20 plus is equipped with a powerful internal BEC system. Do not add additional BEC systems to this module! The module should not be supplied from the output side with +5V at any time. Disregard will cause serious damage to the module!**

> **Power supply for the bc-20 plus is intended to be used with 2s..3s LiPo cellls (6V..12.6V) or 6..10 NiMh cells (6.0V..14V). Do not use 4s LiFePo4 cells as they might damage the module due to their higher voltage level!**

Linking bc-20 plus modules

> If you would like to link multiple bc-20 plus modules please refer to service@brixlelektronik.de for further information.

23.06.14 Vxx417

brixlelektronik *...we got the solution*

bc-12er – 12 channel receiver   bc-20 plus 20 channel receiver

Display/Infrared link

> The bc-12 plus supports either a display connected to output 12 or the infrared connection . If the display is disabled the infrared connection will be enabled automatically.

Servonaut components with cruise control

> If you are running Servonaut speed controllers with cruise control options (M20+,E20 or similar) we recommend to program a high negative value as fail safe for the throttle channel to ensure a proper behaviour in the case of a signal loss. (e.g. -60 to activate the brake funktion)

Within Europe

> This product is produced and labeled according to the

> Directive 2002/96/EC of the European Parliament and of the Council

> of 27 January 2003

> on waste electrical and electronic equipment (WEEE)

Please refer to this directive in case of disposal.