COMMANDER

QUICK REFERENCE MANUAL

Scaleart OHG Schillerstraße 3 D-67165 Waldsee

Dear Customer,

We would like to take the opportunity to thank you for purchasing your new Commander remote control. This fully digital remote control is equipped with plenty of functions which are specially tailored for the requirements of functional models such as trucks, construction machines and ships.
The remote control uses the widespread and reliably working Bluetooth Standard for data transfer.

The present quick reference serves to give you a quick overview of the basic functions and shall facilitate you to enter the Commander technology. Please find thorough information about the individual topics in the Commander manual.

Technical data:

Transmitter	*Commander 5000*	*Commander 1000*	*Commander Basic*
Prop channels	*12*	*6-10*	*4-10*
Switch channels	*20*	*14-15*	*12*
Sticks	*4D*	*2D / alternative 3D*	*2D*
Twinstick	*yes*	*no*	*no*
3rd (mini-) stick	*yes*	*optional*	*no*
Display (diagonal)	*2x94mm*	*94mm*	*54mm*
Display resolution	*240 x 128*	*240 x 128*	*128 x 64*
Display lighting	*yes, both*	*yes*	*yes*
Display switch allocation	*yes*	*no*	*no*
Vibration alarm	*yes*	*yes*	*no*
Sound / voice output	*yes*	*Yes*	*no*
Display telemetry data	*yes*	*Yes*	*yes*
Status display light/gear	*yes*	*Yes*	*yes*
SD card	*Standard SD*	*Standard SD*	*micro SD*
Weight	*2100g*	*1500g*	*1150g*
Dimensions (W x H x D)	*225 x 95 x 270mm*	*225 x 95 x 190mm*	*225 x 110 x 205mm*
Battery	*6 cells 2000mAh 7,2V*	*6 cells 2000mAh 7,2V*	*8 cells 2000mAh 9,6V*
Range	*300m**	*300m**	*300m**

* The manufacturer's data for the transmitter and receiver module amounts to at least 1000m. Depending on the installation in the model (metal housing) and environment conditions the range may be considerably less than the forecast. We checked the range under unfavourable conditions and can confirm them with at least 300m.

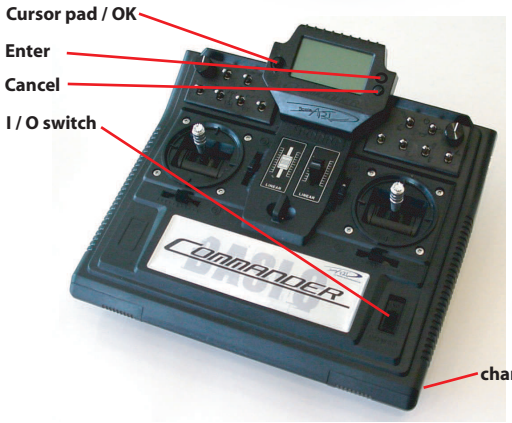
Disclaimer / Compensation:
The compliance with the operating instructions as well as the installation, operation and maintenance of the models and all used components operated with this remote control made by the company ScaleART are not to be monitored. Therefore, the company ScaleART does not assume liability for any loss, damage or cost which result from the improper use and operation and are related to this in any way.
The ScaleART Commander system undergoes continuous development. This may lead to the fact that the soft- and hardware deviates from this description.

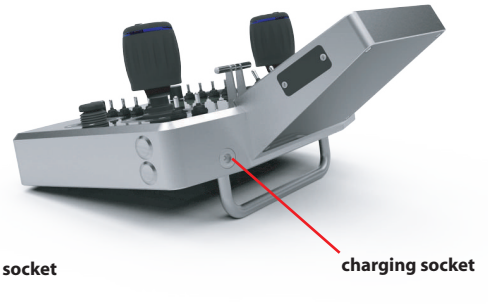
To the maximum extent permitted by law, the obligation of the company ScaleART to pay damages, for whatever legal reason, limited to the invoice value of the products of the company ScaleART which are directly involved in the event causing damage. This does not apply, to the extent that the company ScaleART is obliged to accept unlimited liability in accordance with mandatory law due to our deliberate or serious negligence.
This remote control is not a toy; neither suitable for young people under the age of 14. We reserve the right to make any technical changes and modifications without given notice. We do not accept any liability for errors and printing mistakes. Reprint and copies are only allowed with our declared written approval.

Operating elements:

Switching on/off: Press the red button. Keep the button pressed to switch off the device until the parting message (Bye bye) is being displayed. Shift the **Power** switch upward on the Basic.
Cancel: leaves all functions without continuous modifications. Press the button several times to go back to the main screen.
Menu: opens the main menu and serves to rapidly select typical values when making entries. On the Basic you open the menu by longer pressing on the cursor pad.
Cursor pad: navigates through the menus and gradually changes the input values.
OK: confirms entries. Values which are continuously being saved require longer pressing time on the **OK** button. On the Basic **OK** is entered by pressing on the cursor pad.

Hint: *You may adjust all settings without causing any permanent changes or adjustments by subsequently leaving the function by pressing the button* **Cancel**. *The settings are only continuously saved if you press the button* **OK**.





Charging:

The charging socket on the Commander 5000 and 1000 is on the rear right. Battery: NiMh, 2000 mAh, 7.2Volt.
The charging socket on the Basic is at the front right. Battery Basic: NiMh 2000 mAh, 9,6Volt.
You need the ScaleART charging cable item No.: 76000026 or a standard Robbe / Futaba transmitter recharger cable for charging.

Scaleart OHG Schillerstraße 3 D-67165 Waldsee

Connecting models:

Imagine each model has a phone number (BT address).
Each Commander transmitter which has a number can "call" and control the model. Each recipient can always "be on the phone" with one sender at a time, for all others, the line is "occupied".
The sender has a model directory including names and numbers.
Open the directory from the main screen by pressing the buttons ▲ or ▼. By pressing the buttons ▲ or ▼ again, you may browse the directory, in order to call the selected model, keep the button **OK** pressed until "Model change" is displayed.
The last model which you "called" from the directory will be automatically recontacted when switching the transmitter on again.

Adding new receiver to the directory:
Go to the menu, then press the button ▶ until the "Sender menu" is selected and then select "Search models". A list of all available receivers are being displayed, i.e. switched on, not in contact with another transmitter and not "hidden". If you "call" a model from this list, the address is only temporarily saved in the transmitter.
In order to add the model to the directory, subsequently go the menu "Model menu", to "Model name" and save the name by pressing on the button **OK** a long period of time.
From now on, this model is being listed in the directory and can be called as described above.
Receivers, whose names start with "#", can be found by the transmitters using the function "Search models". Without "#" the receiver is regarded as "hidden" and will no longer be displayed on the search list (also for foreign transmitters).
By pressing the button on the receiver more than 5 seconds (> 5 sec.) it will be made visible once again and gets the standard name #CM1000 resp. #CM5000.

Right or left-handed operation:

Go to the menu, then press the button ◀ until the "Basic settings" is being selected, then go to the "Joystick mode" and press the button **OK**.
Select the desired mode by pressing the buttons ▲ and ▼. Modifications immediately become effective for testing. Continuously save by long pressing the button **OK** a long period of time, leave without making changes by pressing the button **Cancel**.

Configuring receiver:

In order to make settings on the receiver, the model has to be connected to the transmitter.

Predefined Configurations Charging:
In order to charge the prepared model configurations, go to the menu to "Model menu", browse completely to the bottom to "Preconfigured" and then press the button **OK.** Select the desired entry and confirm it by pressing the button **OK** a long period of time. The new configuration will be immediately activated on the receiver.
Please find the available configurations and the corresponding details in the table in the annex.

Changing the Configuration:
The whole configuration is based on the connections on the receiver.
There are connections which are accessible from the outside, for instance for servos, sensors or pumps. And there are internal connections which include the function module (mixer).

Go to the menu to "Model menu", then either select "Connections" or „Functional components", then press the button **OK**. By pressing the buttons ◀ and ▶ browse through the tabs on which the most important parameters for each connection are displayed.
Simple connections have a standard tab.
Functional components (mixer) are equipped with two entries and in most cases deliver two control signals; therefore there is a double-sided tab (right/left) with double width tabs.
Press the button **OK** in order to change the parameters of the displayed connection.
The contents of the displayed menu depend on the operating mode of the connection.
Changes of parameters are immediately temporarily activated (except for "Mode" and "Channel"). In order to continuously save them, keep the button **OK** pressed until the menu is displayed once again.

The following lost explains the most important items:

- **Name** determines the displayed feedback symbol and the assigned function on the light bus resp. IR (turn signal, light, lockout, coupling, trailer servos). Furthermore, it is a reminder what is suspended on this connection. There are 254 predefined terms for selection.

-**Text** Here you can give your own designation for each connection.

-**Mode** determines the operating mode of the connection, for instances if pulses for servos or a simple switch signal are being generated. It depends on the connection and on the receiver which modes would be available. Please find a list below. Briefly press on the button OK in order to activate the selection of the receiver.

-**Channel** determines by which it is being controlled. Three groups are selected by pressing the buttons ▲ and ▼ :

-Control element on the transmitter, move the desired joystick / switch to make the selection;

-Functional components, ◀ and ▶ selects the data of the desired component;

-Connections, ◀ and ▶ selects another connection as control data source;

- Briefly press on the button **OK** in order to activate the selection of the receiver.

-**Layers** determine in whichever layers the connection is active. ◀ and ▶ move the cursor, ▲ and ▼ switch the activation mark on or off.

-**Reverse/Dir** here there are four options: "normal" and "reverse", plus "only left" and "only right". For the last option, the servo only turns to the preset direction independent from the joystick direction.

-**Servo neutral** adjusts the centre position of the servo.

-**Servo trvl** determines the servo travels to the right and to the left. ◀ and ▶ selects the side, ▲ and ▼ changes the value.

-**Expo** determines the control curve to the right and to the left ◀ and ▶ selects the side, ▲ and ▼ changes the value.

-**Sleep period** determines if rep. the period of time after which the servos switches to the resting state.

-**Dead band** determines on servos how far the joystick has to be moved in order to quick the resting state. For switching functions it indicates the difference between switching on and off (hysteresis).

-**Failsafe** determines the Failsafe position (is only approached if there is no connection to the transmitter and controller are imperatively set in a way so that the motor is stopped). If "None" the servo remains at the last received position.

-**Servospeed** determines the maximum speed by which the servo will turn. ◀ and ▶ selects the side, ▲ and ▼ changes the value.

-**Trigger** determines the switching point for the switching functions.

-**Switch names** determine which texts the connection will deliver to the transmitter during the mode switching function. Standard are "on" and "off".

-**Response** determines how sensitive servos react on the joystick in the "Hydraulic mode".

-**Detents** determines in how many positions servos come into in the "Servo camming mode".

-**Port reset** Resets the port den to reasonable values which will suit the mode. Channel, mode, layers, names and text are not modified.

-**Alarm max / Alarm min** adjusts the alarm thresholds for inputs. In order to deactivate the threshold, set the maximum (max) resp. the minimum (min) value.

-**Number format** determines how the measured value is going to be displayed at the entry of the telemetry.

-**Unit char** determines the unit in which the measured value will be displayed in the telemetry

Infrared / Lightbus

In order to control the functions on the bus or on the infrared output, simply generate a switching function on a free port on in a function component and enter the corresponding name for it. Also the multi-switch function module affects the bus and the infrared.

Telemetry

Four (Basic: two) values can be displayed. Go th the menu, open "Model menu" and then "Telemetry".

"Telemetry layers" determine the layer in which the receiver can deliver telemetry values. Usually, all checkboxes should be hooked.

In order to set up a telemetry, go to "Select display field". The available fields are going to be displayed by selecting the desired field by pressing the cursor key and then press the button OK. Thus, the item "Select data source" will directly open up. Then you see the already known presentation of the port of the receiver on the tabs. Select the port to view its values by pressing the buttons ◀ and ▶ and then press the button OK. The item "Scale/Zero" will directly open up. The scale will be displayed at the top left, the zero-point will be displayed at the right, and changed over between these values by pressing the buttons ◀ and ▶. If you set the scale "off", this field will not be displayed. "on" delivers the data of the port 1:1. You can also directly access any item of this sequence from the menu.

Transmitter Update:

Proceeding:

1st Unpack Firmware file and save it on a reformatted SD card.

Basic: Use a Micro SD card

2nd Insert the SD card from the rear with the contact area pointing downward. The card noticeably locks in place and is flush with the housing

SA-1000: Use a standard SD card

2nd Unscrew the screws at the bottom of the transmitter, then remove the cover. Caution: Loudspeaker cable It can stay connected.

3. Insert the SD with the contact areas pointing towards you, the card noticeably locks into place.

SA-5000: Use a standard SD card

2nd Release the cover of the SD card slot at the right of the main display.

3. Insert the SD with the contact areas pointing downward, the card noticeably locks in place.

4. Switch on the transmitter while pressing the buttons "**MENU**" and "**OK**", the Update mode is displayed. On the Basic only press the button "**OK**"

5. After having released all buttons, the file should be displayed. Select by pressing the cursor keys, the start the update by long pressing the button **OK**.

6. After the successful update, the transmitter will automatically start the new Commander software.

7. It is possible to leave the SD card in the transmitter. Close and screw the transmitter together, hereby pay attention to the loudspeaker cable when using the SA-1000.

Menu structure of the main menu

Selection with ◄►

Selection with ▲▼	**Receiver**	**Transmitter**	**Sounds***	**Basic settings**
	Port settings	Search new receiver	Vibration alarm	<**File**> **
	Function blocks	Distplay light	Volume	System info
	<**Telemetry** >	Display dim	Keytone	Radio-parameter
	<**Copy & Save** >	Contrast	System sounds	Status screen
	Select module	Auto PWR off	Battery warning	Joystick-Mode
	Set module ID	TX-battery alarm	Connection	Reset transmitter
	Module names	Radio alarm	Turn signal	Model -PIN 1
	Layen names	Use layer model	Light warning	Model -PIN 2
	Text 1	Owner name	Telemetriy	Model -PIN 3
	Text 2	Text sort.	Inclinometer	Model -PIN 4
	Modell name			Start-PIN
	Modell BT-address			Config-PIN
	Prepare second link			
	Second link mode			
	Delete model entry			
	Reset receiver			
	Preconfigurations			

Menu structure of the submenu

Selection with ▲▼	**Telemetry**		**Copy & Save**		**File****
	Telemetry layer		RX- >Clipboard		Change dir
	Select field		Clipboard->RX		Delete file
	Select data		Clipb.- >single Port		Load TX-data
	Scale/neutral		Copy Port from		Save adressbook
	hide field		Change dir **		Save TX-config
			Delete file **		Receiver update
			Save clipboard **		
			Load clipboard **		
			Save model entry **		
			Load TX-data **		

*only for SA 5000 and SA 1000

**Is only displayed if the SD card is inserted

Operating modes of the ports

	CM1000	CM5000	
Off	x	x	Port switched off
Modes for servos/controllers			
Servo prop	x	x	Servo conventionally follows the joystick position
Servo hydraulic	x	x	Servo moves by hydraulic simulation
Servo-wiper	x	x	Windscreen wiper drive
Wiper interval	x	x	Windscreen wiper drive with memory and interval function
Fixpoint servo	x	x	Servo cams in on up to 5 uniformly distributed positions
Switching servo	x	x	Servo with memory switch: Jog to change over between the end positions
Proportional damp	x	x	Same as Proportional, but with adjustable damping
Modes to switch consumers			
Commander receivers can directly operate an LED on each port. For larger consumers, a switching module is required			
Simple switch	x	x	Simple switch output: ON as long as the button is pressed
Switch memo	x	x	Switch output with memory: Jog to change status
Double switch	x	x	Press upward for Memory, downward for keys
High-beam switch	x	x	Same as Kombi, but Memory is only active if low beam or parking light is on
Interval switch	x	x	Changes over in adjustable intervals between on and off as long as the button is pressed
Interval memo	x	x	Changes over in adjustable intervals between on and off, with Memory
Ports for turn signals release one another. The port "Hazard lights" activates all turn signals synchronously			
Turn signal	x	x	Flashes as long as the button is pressed
Turn signal comf.	x	x	Briefly tip Flashes for 3 seconds, if it is pressed longer, the Memory is being activated
Turn signal+brake	x	x	Combines rear turn signal and brake light in one lamp, for US cars and vintage cars
Turn signal+light	x	x	Combines front turn signal and position light in one lamp, for US cars
Modes to dim consumers			
"PWM [0..max] ",		x	Simple PWM, 0 - 100%, can be operated with potentiometer or joystick.
"PWM [0..max] Hydr.",		x	Simple PWM, 0 - 100%; self-locking, can be operated with key button.
Internal controller (only CM5000)			
Modes for the switching mechanism			
Selector R-N-D		x	
Direction select		x	
Modes for the gas function			
ESC standard		x	Simple controller Forward - 0 - Rear without break
ESC w. brake		x	ESC with brake: Drive - 0 - Break; Forward/Rear-changeover via switching port
ESC + 2-speed		x	Controller with break and 2-gear transmission control Drive - 0 - Break; Gear and direction change via switch port
ESC + 3-speed		x	Controller with break and 3-gear transmission control Drive - 0 - Break; Gear and direction change via switch port
ESC + auto 2s		x	Controller with break and 2-gear automatic controller Drive - 0 - Break; mode and direction change via switch port

	CM1000	CM5000	
Inputs			
Potentiometer		x	Input for potentiometer, measuring range -100%...+100%
Temperature sensor		x	Input for temperature sensor LM35, measuring range 0...100°C
Switch 3-pos. In		x	Input for 3-Pos switch, measuring range plus-off-minus
Simple switch in		x	Input for 2-Pos switch, measuring range on-off
Voltage		x	Input voltage measurement, measuring range 0.0...1.0 volts
RPM-sensor		x	Input tachometer
Measurement	x	x	Measurement input
Inclinometer		x	Internal inclinometer

	CM1000	CM5000	
Function blocks			
All function modules are equipped with two inputs (i and ii) as well as two outputs (left and right).			
X-type-mixer	x	x	X-type-mixer hydr. Left output is i + ii, right output is i - ii
X-type-mixer hydr.	x	x	Same as X-type-mixer, but the left input (i) is working with hydraulic simulation
Limit/splitt	x	x	Dynamically limits the sensor path: the left output follows i, but only as long as i < ii. The left output follows i as soon as i > ii.
Limit/splitt hydr.	x	x	Same as Limit/splitt, but the left input (i) is working with hydraulic simulation
Control-Select	x	x	Switch the control signal entered on i to the left output if ii > 0, and to the right output if ii < 0.
Control-Select hy.	x	x	Same as Control-Select, but the left input (i) is working with hydraulic simulation
Slow/diff	x	x	Left output slowly follows joystick, right output delivers the difference between joystick position and left output
End-switch/reverse	x	x	Control signal on i, is output on left output. Position signal on ii. If ii is larger resp. smaller than the threshold indicated in "Path" it avoids further deflection of left output in the corresponding direction, instead the signal is displayed on the right output
Tracked veh. steer	x	x	Mixer steering brake: Drive inside of the turn is slowed down, drive outside of the turn is accelerated. Left input: Steer, right input: Gas. Vehicle only moves if it is accelerated.
Tracked steer 2	x	x	Same as chain vehicle mixer, but it is possible to turn on the spot with drives working in opposite direction. To do so, first fully turn, then step on the gas.
Get control	x	x	Dynamic control source switch-over: Left output responds to i if released in the current layer, otherwise on ii
Oil-pump control	x	x	Hydraulic pump control Summarizes the deflection of all inputs, several function modules are automatically chained up. Receive pump signal on the last output.
Undervoltage-stop	x	x	Sets both outputs to Neutral as soon as the undervoltage alarm for the operating voltage falls below (setting of the threshold on the port with the battery icon)
Hitch control	x	x	Comfort control of the hoist mechanism : ii preselects the working depth, i controls retracting/lifting by tipping to the front and temporary lifting by pulling back.
Servo curve	x	x	Freely programmable path template with 8 supporting points. (Two channels per function module are possible)
Gear 1-2	x	x	Control for gears with the indicated gears. Left input actuates the gear change. The signal for the switch servo is on the left output. It is possible to prevent switching while driving with the right input: to do so, set to Proportional and position on the throttle stick.
Gear 1-2-3	x	x	
Gear R-1-2	x	x	The right output delivers in addition a signal for forward/rear changeover. When moving backwards, the gear is principally set to the 1st gear.
Gear R-1-2-3	x	x	

	CM1000	CM5000	
Switch in the function modules control the function in the light bus corresponding to the name			
Switch	x	x	Simple switch: ON as long as the button is pressed
Switch memo	x	x	Switch with Memory: Jog to change status
Switch mem. combi	x	x	Press upward for Memory, downward for keys
Brakelight gen.	x	x	Generates a brake light signal from the movement of the throttle stick
Curve/Turnlight		x	Generates the signals for the right and left curve light depending on the low beam, turn signal and steering. Position left input on the steering stick.
Multiswitch	x	x	Generates a multiswitch/multiprop signal. Each side has four inputs, position them on the desired control elements. The left output delivers a Robbe log, the right output delivers a Graupner log. Also controls lightbus / IR output.
Uptime-counter		x	Permanent counter for switch on / operating times. (Two channels per function module are possible)
PLC	x	x	Programmable logistics controlling
PLC extension	x	x	Continuation of the control in the next function module
Turn signal/Gear	x	x	Combines turn signal and control on one joystick for Servonaut: if the left input is retracted more than half, the signal is displayed on the left of the right input, otherwise it is displayed on the right.
MFC-signal sw+prop	x	x	For MFC operation without trimmung: Combines a proportional function on the left input with a switching function on the right input.

Notes regarding the battery ordinance

In relation with the sale of devices containing batteries and accumulators, we are obliged, to point out as follows according to the battery ordinance:

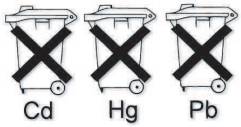
Batteries must not be disposed of with the household waste. Being the end user, you are legally bound to properly dispose of used batteries.

After use, you can return batteries free of charge to municipal collecting points, to the commerce or to us under the following address or return them post paid by mail.

ScaleART OHG
Schillerstraße 3
D-67165 Waldsee
Deutschland

BBatteries containing harmful substances, are marked with the symbol of a crossed rubbish bin, similar to the symbol in the figure below. The chemical designation of the harmful substance is below the symbol of the rubbish bin - in the example below “CD” for cadmium. “Pb” stands for lead, “Hg” stands for mercury.

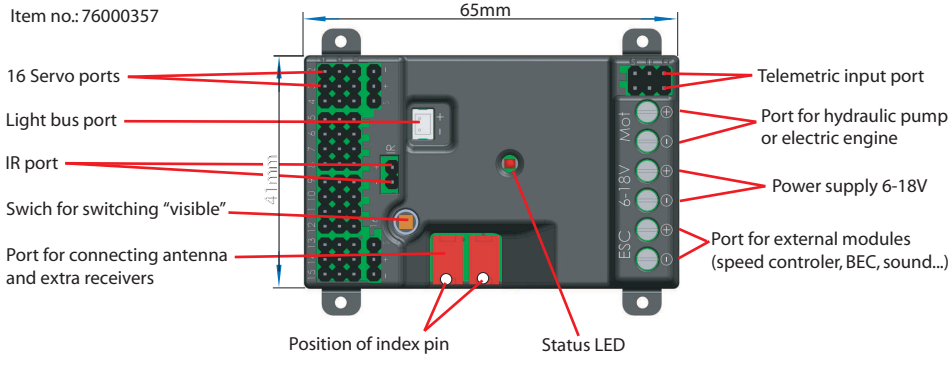
You will also find these notes on the accompanying documents of the consignment or in the operating instructions of the manufacturer.



List of the names and assigned functions on the lightbus / IR as well as feedback symbol

Name	Feedback	Symbol	Bus-Funktion
brake	Brake symbol		Trailer brake
brake left	Brake symbol		
brake right	Brake symbol		
brake front	Brake symbol		
Brake rear	Brake symbol		
Reduction	HI/LO		
Difflock front	Difflock front		Difflock front
Difflock rear	Difflock rear		Difflock rear
Difflock center	Difflock center		Difflock center
1st Funktion			Trailer servo 1
2nd Funktion			Trailer servo 2
Outrigger front	Outrigger symbol		
Outrigger rear	Outrigger symbol		
Outrigger right	Outrigger symbol		
Outrigger left	Outrigger symbol		
Support leg	Outrigger symbol		
Wiper 1	Wiper symbol		
Wiper 2	Wiper symbol		
Saddle plate	Saddle plate symbol		
Trailer hitch	coupling symbol		Coupling servo
indicator right	Turn signal right		Turn signal right
indicator left	Turn signal left		Turn signal left
Hazard warning	Hazard warning		Hazard warning
Low beam	Low beam		Low beam
High beam	High beam		High beam
Rear fog light	Rear fog light		Rear fog light
Parking light	Parking light		Parking light
Light	Parking light		
Brake light			Brake light
Reverse light			Reverse light
1st Rotating beac	Rotating beac		Rotating beac
2nd Rotating beac	Rotating beac		Rotating beac
Beam front	Fog lamp		Fog lamp
Light front	Working light front		
Light rear	Working light rear		
Light right			Cornering light right
Light left			Cornering light left
Horn 1			Horn
Siren			Siren
Engine start			Engine start
Sound brake			Sound brake
Sound air			Sound air
Sound fanfare			Sound fanfare
Sound gears			Sound gears
IR-Robbe			IR protocol switch-over
Trail. Off			IR On/Off

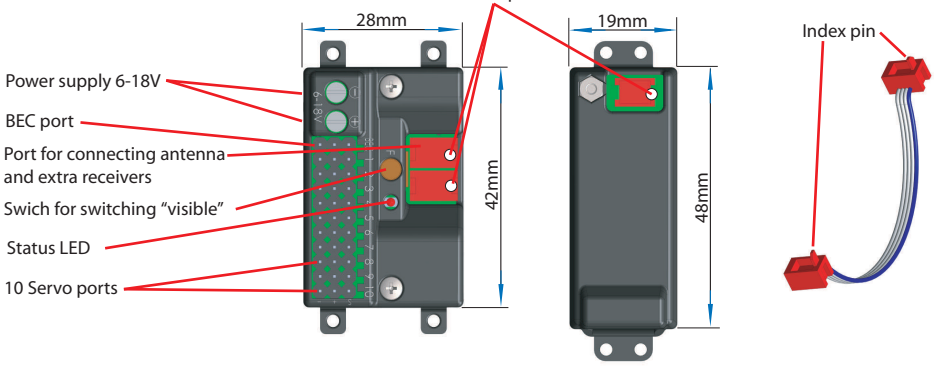
Receiver CM 5000:
Item no.: 76000357



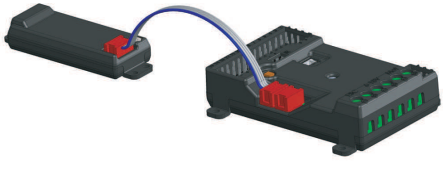
Receiver CM 1000:
Item no.: 76000356

HF-antenna modul:
Item no.: 76000364

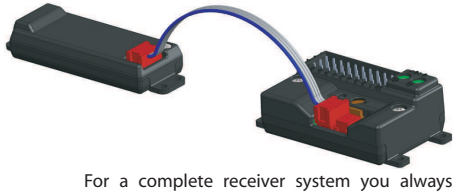
connection cable



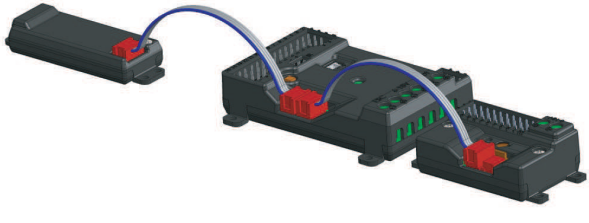
CM 5000 with antenna modul



CM 1000 with antenna modul



CM 5000 extended with 1x CM 1000



For a complete receiver system you always need the receiver and the antenna module. The receiver cannot be operated without antenna.
It is possible to chain up to maximum 8 receivers in order to increase the number of available channels.
When connecting the antenna and the receiver using a connection cable, it is necessary to make sure that the index pin of the red plug is seated in the index hole of the receiver. It is always positioned at the outer boarder of the receiver or of the antenna module.

BEC:

The ScaleART Commander receiver CM-1000 and CM-5000 is equiped with an internal BEC system for its own power supply. This system is active as soon as an external supply tension of 6-18V is applied. However, this BEC system only serves for the internal power supply of the receiver.

You need another additional external BEC system for the power supply of the servo. Depending on how many servos are connected, you can either use the BEC which is used in most cruise control or you may use a separate BEC system. When using a separate BEC system, it is in most cases recommended to remove the red + cable from the servo plug of the cruise control.

It is also possible to operate the Commander receivers without an external power supply Then the receiver is automatically supplied via the servo BEC system. However, a battery monitoring is not given.

Functional Overview Receiver ScaleART Commander

Receiver	*Commander CM-1000*	*Commander CM-5000*
Servo slots	10	16
Usable for switching functions	10	16
Usable as input	-	8 (No 9-16)
Functional modules (mixer)	8	16
Control light bus	Optional	Yes
IT output	-	Compatible with Robbe and Scaleart
Integrated controller for auxiliary or main drives	-	Up to 3 amperes, with excess current, short circuit and temperature protection
Control of multiswitch modules	1 compatible with Graupner, Robbe and Scaleart	8 compatible with Graupner, Robbe and Scaleart
Measurement battery tension	Yes	
Measurement input current	No	Yes
Battery management with reverse voltage protection	No	Loadable with up to 12 amperes, operating voltage maximum 18 volts
Additional sensor ports	-	2
Inclinometer	No	Inclination and pitch
Adjustable alarm thresholds	Battery tension	Individual minimum and maximum values for all measured values
Hydraulic pump control	Monitors max. 16 functions	Monitors max. 32 functions
Mixer for tracked vehicles	Yes	
Limit switch via positions sensor	No	Yes
Undervoltage-stop	Yes	
Controller current limiter	No	Yes
Sequential gearbox control	up to 3 gears	up to 4 gears
Free path template	Yes	
Brake light function	Yes	
Smoke generator control	No	Yes
Resettable operating hour counter	1	4
Adjustable servo manipulating time	0 - 20 seconds	0 - 20 seconds
Adjustable servo paths	0- 200% right and left separated	0- 200% right and left separated
Hydraulic simulation for servos	Yes	
Programmable process sequence control	No	Yes
Password protection	Separated for operation and configuration	
Power supply	BEC or drive battery, from 4.8 to 18 volts	
Bus-compatible (several interpreters in the model)	Yes	
Software update in the model is possible	Yes	

Konformitätserklärung gemäß dem Gesetz über Funkanlagen und Telekomunikationsendeinrichtungen (FTEG) und der Richtlinie 1999/5/EG (R&TTE)

Declaration of Conformity in accordance with the Radio and Telecomunikations Terminal Equipment Act (FTEG) and Directive 1999/5/EG (R&TTE)

Scaleart OHG Schillerstraße 3 D-67165 Waldsee

erklärt, dass das Produkt: declares that the product	Commander SA 5000	Art.Nr.: 76000350
	Commander SA 1000	Art.Nr.: 76000351
	Commander Basic	Art.Nr.: 76000352
	Commander Master CM 5000	Art.Nr.: 76000357 / 359
	Commander Master CM 1000	Art.Nr.: 76000356 / 358
	Commander HF-Antennenmodul	Art.Nr.: 76000364
Geräteklasse: Equipment class	2	

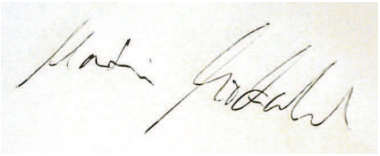
den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des FTEG (Artikel 3 der R&TTE) entspricht.
complies with the essential requirements of § 3 and the other relevant provisions of the FTEG (Article 3 of the R&TTE Directive).

Angewendete harmonisierte Normen:
Harmonised standards applied

EN 60950-1:2006+A11:2009+A1:2010+A12:2011	Gesundheit und Sicherheit gemäß § 3 (1) 1. (Artikel 3 (1)a)) Health and safety requirements pursuant to § 3 (1) 1. (Article 3 (1) a))
EN 301 489-1 V1.9.2 EN 301 489-17 V2.1.1	Schutzanforderungen in Bezug auf elektromagnetische Verträglichkeit § 3 (1) 2, Artikel 3 (1) b)) Protection requirement concernig electromagnetic compatibility § 3 (1) 2, Artikel 3 (1) b))
EN 300 328 V1.8.1	Maßnahmen zur effizienten Nutzung des Frequenzspektrums § 3 (2) (Artikel 3 (2)) Measures for the efficient use of the radio frequency spectrum § 3 (2) (Article 3 (2))

CE 0678 !

Waldsee, 12.August.2014



Martin Michalik, Technischer Leiter
Martin Michalik, technical manager

INVESTIGATION REPORT

Our ref. 264965

Report No. 15343

Products	Bluetooth modules:
Type	1. BLE112 2. WT12 3. WT11i 4. WT41-A 5. WT41-E 6. WT21
Trade mark	BlueGiga
Applicant	BlueGiga Technologies Oy Sinikalliontie 5A 02630 ESPOO, FINLAND
Manufacturer	BlueGiga Technologies Oy
Technical information	Supply voltage: 1.8V - 3.6V Class III Max. RF power <1mW Operating temperature range: -40 °C to +85 °C.
Additional product information	Built in equipment (module).
The product has been tested according to standards	EN 60950-1:2006+A11:2009+A1:2010+A12:2011
The product has been tested according to following parts of the standard	As a result of our technical evaluation following tests and inspection have been carried out: markings/instruction, warnings, protection from hazards, supply, physical requirements and electrical requirements.
Extent of the testing	Products have been verified as built in equipment against applicable part of the mentioned standards. The final assembly in the end product must be verified separately.
Investigation result	PASS
Other information	This report is valid only for the products listed above.
Date	29 August 2011
	SGS Fimko Ltd
Signature	Jari Karlsson Specialist

R&TTE Declaration of Conformity (DoC)

We, Bluegiga Technologies Oy, a corporation validly organized and existing under the laws of Finland having its principal place of business at Sinikalliontie 5A , 02630 Espoo, Finland

declare under our sole responsibility that the product:

WT41

to which this declaration relates is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC). The product is conformity with the following standards and/or normative documents:

SAFETY

- EN 60950-1:2006+A11:2009+A1:2010+A12:2011

EMC (Art. 3(1)(a)):

- EN 301 489-17:V2.1.1
  - ESD immunity, EN 61000-4-2:2009
  - Radiated electric field immunity, EN 61000-4-3:2006 +A1:2008

SPECTRUM (Art. 3(2)):

- EN 300 328 V1.8.1
  - RF output power
  - Occupied channel bandwidth
  - Dwell time, minimum frequency occupation and hopping sequence
  - Hopping frequency separation
  - Adaptivity
  - Transmitter unwanted spurious emissions in the out-of-band domain
  - Transmitter unwanted spurious emissions in the spurious domain
  - Receiver spurious emissions
  - Receiver blocking

Supplementary information:

Technical file held by: Bluegiga Technologies Oy

Place and date of issues (of thid DoC): Espoo, 02.05.2014

Riku Mettälä, VP / Product creation

Bluegiga Technologies
Sinikalliontie 5A, P.O. Box 120
02630 Espoo FINLAND
Tel +358 9 435 5060 | Fax +358 9 435 50660
Co ID 0934238-1, VAT registered, domicile: Espoo
www.bluegiga.com | sales@bluegiga.com

TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification

Issued Under the Authority of the

Federal Communications Commission

By:

ACB, Inc.
6731 Whittier Avenue Suite C110
McLean, VA 22101

Date of Grant: 05/15/2013

Application Dated: 05/14/2013

BlueGiga Technologies Inc.

Sinikalliontie 5A

Sinikalliontie 5A

Espoo, FI-02630
Finland

Attention: Pasi Rahikkala , HW Compliance Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: QOQWT41
Name of Grantee: BlueGiga Technologies Inc.
Equipment Class: **Part 15 Spread Spectrum Transmitter**
Notes: **WT41 long range class 1, Bluetooth 2.1 + EDR module**
Modular Type: **Single Modular**

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2402.0 - 2480.0	0.041		

Output power listed is conducted. Single Modular Approval for mobile RF Exposure conditions, this transmitter must be installed to provide a separation distance of at least 22 mm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures. Approval is limited to OEM installation only. OEM integrators must be provided with antenna installation instructions. OEM integrators and end-users must be provided with transmitter operating conditions for satisfying RF exposure compliance. This grant is valid only when the device is sold to OEM integrators and the OEM integrators are instructed to ensure that the end user has no instructions to remove or install the device.

Only the antennas listed with this filing and documented in the test report and user manual can be used with this module. This Grant covers variants WT41A and WT41N.

Class 2 Permissive Change to allow mixed portable and mobile use.

CERTIFICATE OF ACCEPTANCE FOR CANADA

CURTIS-STRAUS

Certificate No.	:	CS05962
Certification (label) No.	:	5123A-BGTWT41
Certificate issued to (holder)	:	Bluegiga Technologies Oy Sinikalliontie 5A Espoo, FIN-02630, Finland
Type of certification	:	Family
Model names	:	WT41-A, WT41-N
Type of radio equipment	:	Modular Approval, Bluetooth device
Equipment name/description	:	WT41 Bluetooth Module
Specifications	:	RSS-Gen, Issue No. 3, Issue Date: December 2010 RSS102, Issue No. 4, Issue Date: March 2010 RSS210, Issue No. 8, Issue Date: December 2010
Frequency range	:	2402MHz – 2480MHz
R.F. power rating/field strength	:	0.04W
Antenna information	:	Dipole with 2.3dBi gain
Emission designator	:	1M40G1D
Test laboratory	:	TRaC Telecoms & Radio Ltd Unit E, South Orbital Trading Park, Hedon Road Hull, HU9 1NJ, United Kingdom Tel: 44 1482 801801 Fax: 44 1482 801806 john.charters@tracglobal.com
Test lab company No.	:	3483A

Certification of equipment means only that the equipment has met the requirements of the above noted specification. Licence applications, where applicable to use certified equipment, are acted on accordingly by the issuing office and will depend on the existing radio environment, service and location of operation. This certificate is issued on condition that the holder complies and will continue to comply with the requirements and procedures issued by Industry Canada / La certification du matériel signifie seulement que le matériel a satisfait aux exigences de la norme indiquée ci-dessus. Les demandes de licences nécessaires pour l'utilisation du matériel certifié sont traitées en conséquence par le bureau de délivrance et dépendent des conditions radio ambiantes, du service et de l'emplacement d'exploitation. Le présent certificat est délivré à la condition que le titulaire satisfasse et continue de satisfaire aux exigences et aux procédures d'Industrie Canada

Certified radio equipment shall not be distributed, leased, sold, or offered for sale in Canada prior to the listing of the device in the Industry Canada radio equipment list (REL).

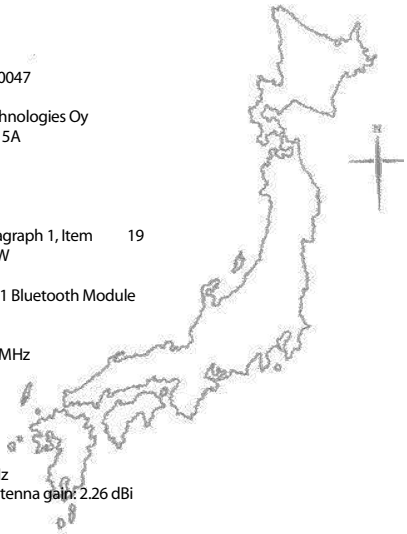
Date of issue: April 14, 2011

Authorized by:

For Curtis-Straus LLC
Michael Buchholz
Certifier

American Certification Body Inc.
6731 Whittier Ave, Suite C110, McLean, VA 22101
Ph: (703) 847-4700, Fax: (703) 847-6888

JAPAN CERTIFICATE OF CONSTRUCTION TYPE



CERTIFICATION No.	?	ATCB013105
RADIO LABEL MARKING	?	R 209 - J00047
ISSUED TO	?	Bluegiga Technologies Oy Sinikalliontie 5A 02630 Espoo Finland
CLASSIFICATION OF SPECIFIED RADIO EQUIPMENT	?	Article 2, Paragraph 1, Item 19 Category: WW
MODEL / NAME OF EQUIPMENT	?	WT41 / Class 1 Bluetooth Module
FREQUENCY RANGE	?	2402 - 2480 MHz
EMISSION DESIGNATION	?	F1D, G1D
R.F. POWER RATING	?	0.12 mW/MHz Maximum antenna gain: 2.26 dBi

NOTES: This certificate does not pertain to requirements that may be applicable under the Telecommunications Business Act for certain types of telecommunications terminal equipment which are subject to both the Radio Act and Telecommunications Business Act.

This is to Certify that the above Type Certification has been granted in accordance with the provisions of Article 38-24 Paragraph 1 of the Radio Law.

ORIGINAL DATE OF ISSUE: February 19, 2013
REVISED DATE OF ISSUE: N/A? ? ? ?

Michael F. Violette
Director

071612-08b