## **CRU Manual**

## Digitech Electronics B.V. C.Groen/S.Kruise



Digitech Electronics BV Ph: +31454059000

Email: info@digitech.nl Company website: www.digitech.nl

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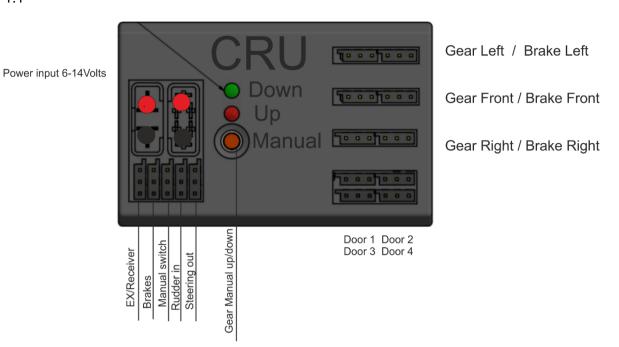
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## SECTION 1: CRU install and Connections

1.1



#### 1.2

Jeti installing

The CRU is completely Menu driven thru the Transmitter. To make sure you have all the correct files it is important :

1 . have the latest Firmware

2 . Have the latest BIN file for Jeti

You can find these at our website products on : <u>https://www.digitech-aerosports.nl/product/919884/digitech-cru</u>

Updating firmware :

The CRU has a build in USB, connect the CRU with a micro USB to your PC. You must have Windows 10 or above. Connect the CRU and wait until the driver is installed.

Start Programmer.exe (found also at our product page )

🐕 Programmer		_	
Select COM port:	File	Program	Reset Device settings
Refresh	Show log	Close	Show info

Select the Comport where your CRU is connected to . Click on the right side next to file , and select the correct Firmware file.

If you loaded the correct firmware the Program button will become highlighted and you can press it.

The CRU will be updated.

JETI TX

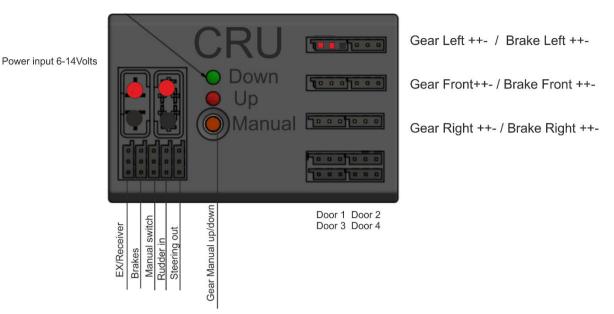
Bin file

For the Jeti TX to work correctly with your CRU it is important to load the Bin file into your TX.

Download and save the BIN file onto your computer. (it is a zip file unpack first!) Copy the Binfile onto your TX Devices folder.

How? Connect usb cable from your TX to your PC Turn TX on , if asked USB? You press ok. On your PC a folder will open showing the index of your TX memory card. Copy the CRU.bin into the Device folder. (if not already there!) Done.

# SECTION 2: Connecting to your Receiver and landing gear



To Connect to your Jeti receiver or Central Box. Connect the EX/Receiver to a free EX or EXT channel on your Jeti receiver or central box

You MUST have a free EX port on your receiver. Make sure this port is set to EX / Serial.

## 2.1. Battery

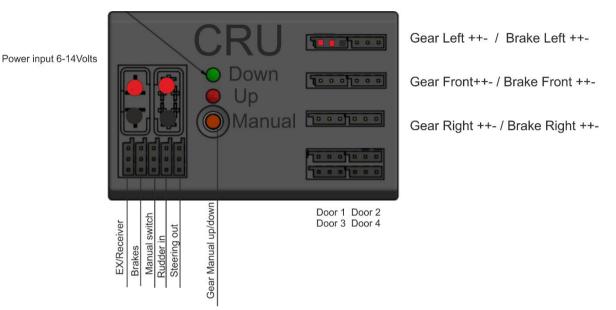
Anything works between 6 volts and 14 volts. NOTE! Ask your manufacturer the voltage for the landing gears.! The CRU will pass ALL voltage thru to the Landing gear. EXEPT for the Doors these are driven directly by the Receiver Voltage!

Example :

JP landing gears 2S LI-PO / LI-ON for most Gears , Max 3S LIFE 9,9 volts for the AR200! Electron Most gears 8,4 Volts 2S or 3S LIFE for ER50 If not sure READ the manuals or ask the manufacturer.

Sensors : in the TX you can find sensor 1: Voltage you can use this value to set a certain alarm if a min voltage is reached.

## 2.2 Hardware connections



Gear and brakes

On ALL connectors for the gears and brakes are 2 positives and 1 negative.

The first 2 pins are ALWAYS positive the third pin is negative.

This way almost ALL gears can be directly connected.

JP gears have small JST connector

Whilst Electron has positive followed by free space and Negative.

Make sure you connect the corresponding Left gear Front gear and Right gear

Same goes for the brakes.

MANUAL : if you shortcut pin 1 and pin 3 the gear will go up and or down.

You can make a external switch to this port if the button is hard to reach.

The Orange button is also to Retract and deploy the landing gear with using the TX..

Connect the Front steering servo to the STEERING OUT port!

TX	Default		14:09:15	100%
	Gene	eral Se	ttings	
< Bac	k			
Device	ID		Ma	ster 💌
Orientation of CRU Flat on bottom 💌				
>> Sav	e all sett	ings		
Back	×	C	смр	Ok

Mounting the CRU there is a arrow on the CTU this MUST point forwards the nose of the aircraft.

In the general settings you can set the orientation of the unit standard its set on flat on bottom.

Device  $\ensuremath{\mathsf{ID}}$  : when you use more then one  $\ensuremath{\mathsf{CRU}}$  , you can set the first one to master and the others to slave.

NOTE! GYRO if you use a Gyro in your aircraft we strongly recommend you USE that servo to control also the nose steering.

And disable the GYRO function in the CRU!

## SECTION 3: Connecting to your Receiver and landing gear

## 3.1

## Jeti Programming : Channels

First set the following ports Virtual no need for physical PORT!

#### Retract Brakes

In the Setup you can choose then the max and min for your gear and brakes.

Tx Default 14:09:19 100%	Tx Default 14:10:37 100%
Retract Settings	Brake Settings
<< Back	<< Back
Gear channel Gear (11) 🔽	Brake channel Kanal 2 (2) 💌
>> Set gear up position 100 %	>> Set no brake position -1 %
>> Set gear down position -100 %	>> Set full brake position 100 %
Retract speed 100 %	Gyro compensation Enabled 💌
# Down delay Up delay	Gyro gain 30 % 💌
Back 🗙 🞜 🛱 ன Ok	Back 🗙 🞜 🚂 ன Ok

First Select your gear channel and then set switch to up and press Gear up pos. Same for gear down.

Repeat steps for Brakes,

Front steering, select the Rudder channel also to control your Front steering. It will simply listen to the rudder channel.

The Steering can be adjusted inside the CRU.

## SECTION 3.2:

## Gyro and Steering.

IF you use a Bavarian Demon or any other gyro that controls also your rudder we STRONGLY recommend you use THAT gyro to also controll your front steering servo.

Simply disable the Compensation!

Select your Rudder channel to act as the "master" The steering will follow this signal. Set the left , Right , and centre.

Don't forget to SAVE. Also the center will be used as a return reference when retracting. The front steering will be DISABLED as soon its retracted and will go to centre.

Tx Image: Tx <th image<="" th=""><th>Tx<sub>a00</sub>[]]<sup>4</sup> Default 14:09:40 100%</th></th>	<th>Tx<sub>a00</sub>[]]<sup>4</sup> Default 14:09:40 100%</th>	Tx <sub>a00</sub> []] <sup>4</sup> Default 14:09:40 100%
Front Steering Settings	Front Steering Settings	
<< Back	Gyro gain 50 % 🔽	
Gyro compensationEnabled ▼Gyro gain50 % ▼	Rudder channel Kanal 3 (3) ▼ >> Set left position -100 %	
Rudder channel Kanal 3 (3) 💌	>> Set center position 0 %	
>> Set left position -100 %	>> Set right position 100 %	
>> Set center position 0 %	>> Save all settings	
Back 🗙 🗯 🥁 Ok	Back 🗙 🖸 🚋 📷 Ok	

## **SECTION 3.3: Retract settings**

Retract settings.

Retract speed :

Tx_000'	Default		14:09:22	100%	
	Retr	act Set	tings		
Retra	t speed			100 %	
#	Dow	n delay	Up delay		
M1		2 5	2 5	5	
M2		0 S	0 9	5	
M3		3 S	3 5	5	
>> Save all settings					
Back	×	S	СМД	Ok	

You can set independent the speed for all 3 gears.

In down and in upwards position.

This is perfect for scale applications.

## **SECTION 3.4: Retract Parameters.**

To set the Retract parameters you NEED to know the max Mah used by the Retracts.

Ask your Manufacturer about these.

If they don't supply them its no problem eather.

Go in this menu do a full cycle and see what your max mah used are and the time it takes.

Then add this and add 10% to these values.

A few Values we have for you :

Max Voltage and currents for Electron :

The below values come directly from info from Electron pages and manuals.

**Voltage increase**: The last software for ER-30 and ER-40 allows to increase the voltage up to 13V (not for ER-50). With 3S LiPo it is posible increase the brake torque a little. Old control units can be updated with the new software: (contact us). Is possible test the controller with 3S LiPo to know if this controller accept 13V. If not, the retracts simply will not run, nothing should burn. The ER-50 is limited to 10V (3S LIFE) for security, so only mechanical adjustments are posible.

ER30 : 500MaH ER40 : 1400Mah ER50: 2500MaH

#### ER-30: 3S LiPo or 3S LiFe ER-40: 2S Lipo or 3S LIFE ER-50: 2S LiPo 3S LIFE!

For JP Retracts : all gears 2S lipo , ER200 3S LIFE 9,9 volts!

Leave the rewind time on 50ms , this is standard used on all brands.

And makes sure the gearboxes are not damaged and or get stuck in a full load.

Also you can select the max start time it takes to move the max stop time

leave at 3.5ms)

You can also set the min cycle time and the Max cycle time.

If it will go OVER this time the retract will stop and think it's a obstruction

It will then give a Status number to your TX and you can set a alarm.

Look further in this manual for status messages.

Tx Default	<b>14:09:26 100%</b>	Tx Default	14:09:32 <b>100%</b>
Retract Pa	rameters	Retract	Parameters
< Back		Max starttime	
Max current	1.2 A 💌		150 mS 💌
Max starttime	150 mS 💌	Max stoptime	3.5 mS 💌
Max stoptime	3.5 mS 💌	Rewind time	50 mS 💌
Rewind time	50 mS 💌	Min cycle time	0 S 💌
		Max cycle time	12 5 💌
Min cycle time	0 S 💌	-	
Max cycle time	12 5 💌	>> Save all setting	gs
Back 🗙 🖸	🕻 🛄 смр 🛛 Ok	Back 🗙	C CMD Ok

## Section 3.5 Brakes and ABS

Set your Virtual channel set max and min braking

You can enable or disable gyro to help with anti skid braking.

Tx_000	Default		14:10:37	100%		
Brake Settings						
< Bac	:k					
Brake (	channel		Kanal	2 (2) 💌		
>> S	et no bra	ke positi	on	-1 %		
>> S	et full bra	ke posit	ion	100 %		
Gyro compensationEnabled ▼Gyro gain30 % ▼						
Back	×	C	СМД	Ok		

Set gain more or less or turn off

## **Pulsed Brakes (ABS)**

its not a "real" abs since it has no rotating sensors.

HOWEVER you can set a PWM signal towards the brakes this will VERY fast turn the brakes on and off multiple times per seconds.

This is ideal if you have a lot of locked wheels and flat spots on tyres.

We recommend using about 40-60% for start.

## **BRAKE MAX settings**

Brake max settings.

This way if you have a brake that brakes more on the left then the right , you can compensate by turning down the max power to that brake.

Also when using the unique Front brakes we suggest you use 80% in the back and 30% for the front.

You will notice the very quick stops for aircrafts specially when they are a little heavy

Tx □000 Default	14:1	0:46	100%		
Brake Settings					
кишиет дант		Z	U 70 []		
Pulsed brakes	Disabled 💌				
Brake 1 max	0 mA	10	0 % 💌		
Brake 2 max	0 mA	10	0 % 🔽		
Brake 3 max	0 mA 100 % 💌				
>> Save all settings					
Back 🗙	S 🗖	смD	Ok		

## 3.6 Brakes : Rudder compensation.

This is made for models that are a tail dragger like the new Elite Aerosports Bravado

That is a jet but with tail wheel .

You can imagine because of the thrust line it is imposible to make a turn on low speeds.

So there is the option Rudder compensation, basicly if you give left rudder it will brake on the left wheel more then on the right wheel and vice versa.

This will cause just like on a real aircraft to turn the aircraft fairly quick!

TX 000	Default		14:10:42	100%		
Brake Settings						
,	0pe		L.1.6			
Gyro	gain		3	i0 % 🔽		
Rudde	r compens	sation	Enabled 💌			
Rudo	der gain		20 % 💌			
Pulsed brakes			Disa	bled 💌		
Brake 1 max 0 mA			10	0 % 💌		
Back	×	S	Смр	Ok		

## Section 4 : Sequenser and Doors

You have 4 doors available

Each door reacts to the Gear in up or down position.

You can enable or disable each door

It also measure the Mah used for each door to spot a problem.

You can set the max up position , max down position.

The time for the movement.

You can also set the time for reverse delay.

So each door is freely programmable for ANY movement and time to popen and close.

Tx Default	14:09:58 <b>100%</b>					
Door 2 Servo Settings						
<< Back						
Door Servo 2	Enabled 💌					
(door servo current	12 mA)					
Gear up position	2250 uS 💌					
Gear down position	1408 uS 💌					
Time for movement	0.0 S 💌					
Delay when gear up	155 💎					
Back 🗙 🖸	Смр Ок					
Tx Default ■	14:10:01 <b>100%</b>					
Door 2 Servo	Settings					
Gear down position	1408 uS 💌					
Time for movement	0.0 S 💌					
Delay when gear up	1.5 S 💌					
Delay when gear down	0.0 S 💌					
Delay when reverse 6.0 S 💌						
>> Save all settings	>> Save all settings					
Back 🗙 🖸	🛄 смр 🛛 Ок					

# Section 5 : System status & Telemetric and warnings.

5.1 Status.

Measured input voltage

Max currents moment / and max

Time it taken to open and close (important for maintenance or spotting a problem)

Tx BODO	Default		14:10:51	100%		
	System Status					
< Bac	:k					
Battery	Battery voltage 8.3 V					
Motor	1 current	/Max	0 mA /1942 mA			
Motor	2 current	/Max	0 mA /1811 mA			
Motor	3 current	/Max	0 mA /	1951 mA		
Motor 1 last move 6.2 S						
Motor 2 last move 715						
Back	×	C	смр	Ok		

Brake currents should be equal! Depending on state fo the brakes and wiring!

Easy to spot a problem!

Tx	Default		14:10:56	100%			
	System Status						
INIULUI	i iust iiio	v.		U.2 J			
Moto	r 2 last mov	ve		7.1 S			
Moto	r 3 last mov	ve		6.5 S			
Brake	1 current			0 mA			
Brake	2 current			0 mA			
Brake	Brake 3 current 0 mA						
Doors current/Max 12 mA 880 mA							
Back	×	C	СМД	Ok			

Doors max used (all doors get power from your TX!)

Frames CRC errors left : Frames send / Right Frames faulty

5.2 Telemetric sensors :

In the sensor setup you can see the following sensors so you can set alarms or program triggers to use.

X Default		17:48:5	2 43 <mark>%</mark>
Sensor	s/Loggi	ng Set	up
		00,854	<b>Ľ</b>
1 Batt		V	Yes 💌
2 M1		mA	Yes 💌
3 M2		mA	Yes 💌
4 M3		mA	Yes 💌
5 B1		mA	0mA
6 B2		mA	Yes 💌
Auto	(10)	×	Ok
x Default	-	17:48:	57 43%
80000	_	17.10.	
	s/Logg		
	s/Logg		
Sensor	s/Logg	ing Se	tup
Sensor	s/Logg	ing Se	tup
Sensor 4 M3	s/Logg	ing Se mA	tup Yes 💽
Sensor 4 M3 5 B1	s/Logg	ing Se mA mA	tup Yes 💽 Yes 💽
Sensor 4 M3 5 B1 6 B2	s/Logg	mA mA mA	tup Yes V Yes V Yes V
Sensor 4 M3 5 B1 6 B2 7 B3		mA mA mA mA mA mA	tup Yes • Yes • Yes • Yes •

Gear State:

- 1: Gear moving down
- 2: Gear is down
- 3: Gear moving up
- 4: Gear is up
- 0: Unknown

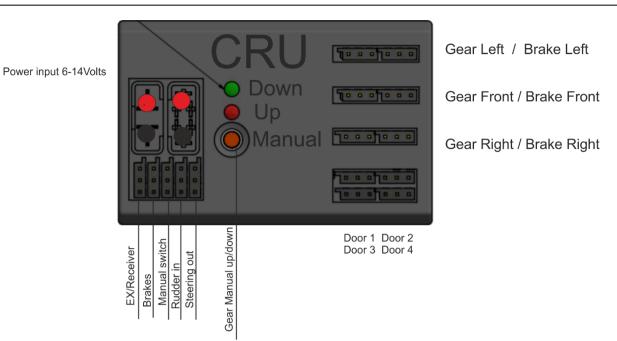
You can set voice messages so that when a gear is Really up (all 3) you can call out gear up. Or when gear is going up or down have a voice message Gear is retracting.

Also you can program any alarm when gear state is 0.

This means of the gears is stuck or is not fully deployed or retracted.

## Section 6 : Using the CTU for other systems and programming over PC

6.1 connections



Connect EX / receiver to your Retract channel Brakes : Brakes channel Manual switch : for external usage of a button to enable the gear in or out. Rudder channel in Steering out.

Written by Sandor Kruise. Digitech Electronics BV. All rights wronged all wrongs reversed  $\bigcirc$  © 2020 If you see any mistake please let us now on <u>info@digitech.nl</u>

S.Kruise / C.Groen