

User manual RIVERDALE RECEIVER

(download user manual FS-i6 transmitter from: www.riverdale-loco.com/Telemetry.html)

Description

With the Riverdale receiver it is possible to read the boiler pressure on your transmitter using telemetry. This is very comfortable when you cannot read the pressure gauge for a long period of time. On top of that – when selecting AUTO mode - the Riverdale receiver will open and close the damper automatically at a certain preprogrammed pressure.

And should you want it, the receiver could control front, back and cab lamps.

How it works

A temperature sensitive resistor is fitted under a boiler band. The temperature of the boiler equals the temperature of the steam inside the boiler which equals pressure (120°C=15psi; 133°C=29psi; 144°C=44psi; 152°C=58psi). A very little microprocessor is programmed to calculate the pressure and – in AUTO mode - to open and close the damper automatically.

Specifications

The little microprocessor together with a Reely/Flysky receiver is build into the Riverdale receiver. The Riverdale receiver is as small as a Planet T5 receiver and has its connectors in line with its casing just like the Planet T5 receiver. So it fits optimally in all Riverdale locos.

The first 6 seconds after turning on the receiver its voltage is displayed instead of steam pressure.

A standard telemetry combo is used, meaning that the display is in Volts. While calibration is in Psi, 40 Psi for example is displayed as 4.0V. Minimal pressure displayed is 8 Psi (0.8V).

For the Riverdale receiver you need a Reely HT-6 or similar Flysky FS-i6 transmitter.

Controlling the RIVERDALE RECEIVER with right up/down stick

DOWN: activates whistle and turns on AUTO mode.

UP (short): closes damper and turns off AUTO mode.

UP: holds the damper in any selected position (HOLD mode). Up in AUTO mode toggles lamps.

UP until transmitter displays 0.6 volts (takes 5sec): brings you in PROGRAM mode.

In PROGRAM mode

To alter the preprogrammed AUTO mode pressure, UP increases and DOWN decreases pressure in steps of 2 psi. In PROGRAM mode, the preprogrammed pressure is displayed and not the actual pressure. For example a set 45 Psi is displayed as 4.50V. To get out of PROGRAM mode, hold stick UP until transmitter displays 0.6 volts (takes 2sec), which brings you into manual mode.

In PROGRAM mode, the damper opens and closes automatically at the preprogrammed pressure.

What you should know: physics

During running when you see pressure rising or dropping fast, “overreact”. So open or close the damper real early. This will compensate for the time lag of up to 30-90 seconds on which the fire will react to changes of the damper.

Under normal conditions the temperature sensitive resistor measures pressure quite accurately. But take note of a time lag of about 4 seconds between measured pressure and gauge pressure. This is noticeable when the pressure rises fast. During firing-up use the gauge pressure.

The AUTO mode does not compensate for both earlier mentioned time lags: it will only open and close the damper at the preprogrammed pressure. You still have to do the thinking!

What you should know: user interface

The damper/whistle transmitter stick spring must not be removed; it needs refitting when removed.

Short is very short and shorter than 0.3 second. You only tip the stick, no need to do a full stroke.

Toggling lamps: off – front – front&cab – front&cab&back – cab&back – back – off –

After powering-up AUTO mode is off.

Don't want AUTO mode after whistling: give a short UP.

In AUTO mode after activating the whistle the damper stays closed for 5 seconds. This limits extreme servo movements when whistling a couple of times in a row.

When voltage/pressure indication does not show up after powering up, switch receiver off and on.

Fitting the Riverdale receiver into your loco

Follow the instructions in your R/C kit user manual for Planet T5. The Riverdale receiver fits the same way. When upgrading your loco to telemetry, ask for the latest R/C kit user manual. Packed together with the receiver are 2 replacement Tye-raps for fixing wiring.

Connections (CH2 is damper/whistle servo)

S1	S2	S3	S4	S5	S6	B	-/+S1-S6: servo CH1-CH6	-/+: battery -/+	
+	+	+	+	+	+	T	-/T: temperature sensitive resistor	-/B: bind receiver	
-	-	-	-	-	-	-			
Lf	+	Lb	+	Lc	Pi	-	Pu	+/Lf, +/Lb, +/Lc: front,back and cab lamps	Pi-/Pu: firmware

Connecting and adjusting

Connect the receiver battery plus and minus to an unused servo connection.

For Amy you need to reverse the servo direction first (see paragraph at bottom of page).

S2 is damper, S3 regulator and S4 reverser. To control reverser with switch C as well: program mixer.

Before connecting lamps to the Riverdale receiver check wiring for short-circuits with a battery.

Do not remove the jumper that connects 'Pi' with '-!.

Bind receiver and go to RX battery setting (see paragraph 11.01 and 16.09.02 of transmitter manual).

Set LOW/ALARM/HIGH to 0.0/0.1/5.8V. For a combo all this is already done. For a warning beep when pressure is low (and when transmitter displays 0.6V), set ALARM for example to 3.0V.

Adjust servos - except the damper-whistle servo - according to the transmitter manual. The damper-whistle servo adjustment is described below.

Fine-tune servo MID as described in the manual of the transmitter (use sub-trim in the menu). Reset HOLD and AUTO mode first with a short UP. When adjustment is needed over more than half the transmitter range either way, calibrate the receiver (next paragraph) just before leaving this half range. When using the receiver for a new model start with the same sub-trim as for the old model.

Program the DOWN and UP position as described in the transmitter manual. After each change check the damper opening (3.5-4mm measured on top of the firebox door) with a full UP. After finalizing adjusting servo MID, DOWN and UP positions the receiver needs to be calibrated as described next.

Calibration receiver

Long UP until transmitter displays 0.6 volts (5sec, program mode) - long DOWN until transmitter displays 0.6 volts (2sec, pressure calibration mode) - long UP until transmitter displays 0.6 volts (2sec, programs damper open position for AUTO mode) - release stick and wait for 2 seconds to get out of PROGRAM mode, which brings you into normal mode (calibrates servo MID).

To program the damper open position for AUTO mode for example halfway, hold the stick halfway up at the last long UP. After 2 sec the actual programmed damper position is visible until you release the stick.

Calibration pressure

Pressure on the transmitter as delivered is accurate within several Psi. For better results a calibration can be done. Calibration of the pressure reading should be done under steam like this: long UP (5sec) - long DOWN (2sec) - UP/DOWN to change the displayed pressure in steps of 1 psi. Adjust displayed pressure to the actual pressure reading on the gauge. But do give the loco ample time (up to 3-8 minutes!) to stabilize pressure. It's easiest done on a rolling road or on blocks.

Note: in this mode the damper opens and closes automatically so you can stay in this mode as long as you like.

To go back to normal mode: long UP (2sec) - release and wait (2sec). Take note: this programs the damper open position for AUTO mode and the servo MID position again (see previous chapter).

Reverse/normal servo

Before you select reverse servo direction in the transmitter, first program the receiver like this: long UP (5sec) - long DOWN (2sec) - long DOWN (2sec) - release stick and wait (2sec). Which brings you back to normal mode. Now select reverse servo direction on transmitter.

In case you want to toggle back to normal servo direction (reverse has to be selected in the transmitter): long UP (5sec) - long DOWN (2sec) - long DOWN (2sec) - release stick and wait (2sec). Which brings you back to normal mode. Next select normal on transmitter.