

IGNITION T-SWITCH WITH BATTERY ELIMINATOR



User Guide



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ARR
Advanced Radio

Thank you for your purchase of the Advance Radio Battery Eliminator Ignition Telemetry Switch (T- Switch).

Following on from our highly successful ignition switches, we are proud to announce the worlds first IBEC Ignition switch with full telemetry.

After speaking with pilots all over the world we came to understand, that there was a need to know what is happening with our expensive engine investment especially for the first few flights.

It is also great to have ongoing monitoring to ensure a longer motor life.

Many pilots are also flying with an IBEC and so our engineers went to the lab and developed the worlds first Ignition Battery Elimination (IBEC) kill Switch with full range Telemetry for RPM and temperature for 1 cylinder up to 7 cylinders. Ignition T-Switch can also be used to measure temperature (up to 300C) on any other part of your model.

With 2 years in development and testing our engineers are proud to offer all pilots a complete ignition switching and monitoring solution with complete telemetry for all engines, from single, twin, triple, quad up to 7 cylinder engines and at a fraction of the cost of other combined ignition and telemetry systems.

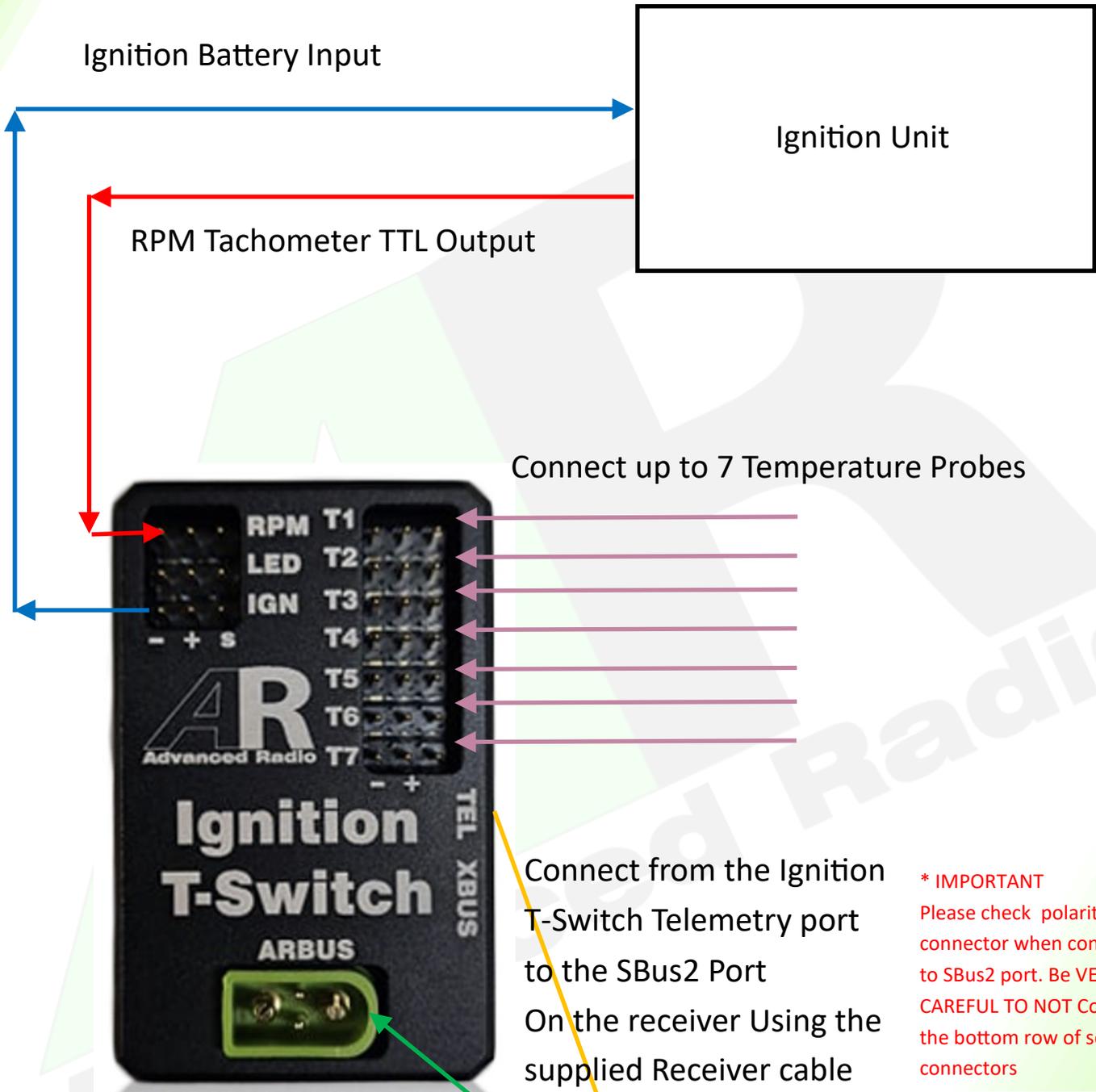
LETS GET STARTED — in this guide we will show you how to get the most out of the Ignition T-Switch. Please take the time to read and understand this guide before installation.

T- Switch Features and Specifications:

- Ignition kill switch with LR filtered Battery Elimination Circuit (BEC). No ignition battery required.
- Runs with all 6Volt and higher ignition systems.
- Sends RPM telemetry to your telemetry radio. Telemetry is taken from the TTL output of all major Ignition systems like RCEXL.
- Supports engines like DLE, GP, Moki, UMS, Saito, ZDZ, GP and any engine with a RPM TTL output.
- Send up to 7 temperature probe values to your telemetry radio.
- Supports telemetry for Futaba SBus2, Jeti EXBus, JR XBus, FRSky Sport, Spektrum Xbus.
- Supplied with 1 temperature probe. Add more probes as required.

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Ignition T-Switch Futaba SBus2 Setup



Connect from your chosen receiver Ignition Switch Channel to ARBUS Input using supplied AR1 to JR lead. This will be the IGNITION KILL SWITCH channel



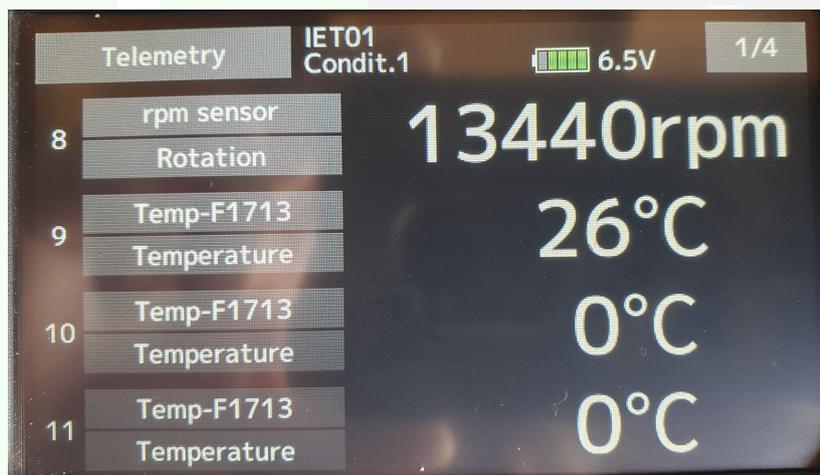
Ignition T-Switch Futaba SBus2 Setup

RADIO SETUP

After making connections on the AR Ignition T-Switch you will need to bind the receiver to the TX then attach the temperature probes to the motor. You will also need to set up telemetry in the Futaba Radio. With the receiver bound, power up the model and radio. The Ignition T-Switch will automatically sense the protocol of the radio and start sending telemetry. Double check that the ignition channel matches the receiver output for the AR servo connector. You can now test the ignition kill switch channel in the TX is switching the Ignition T-Switch. The blue LED will glow when the ignition is active. If necessary you can reverse the Ignition channel in the TX.

FUTABA RADIO TELEMETRY SETUP

The Ignition T-Switch emulates the standard Futaba RPM sensor and up to 7 Futaba F1713 Temperature sensors. You will need to set the RPM sensor up on telemetry **Slot 8** in the radio and Temperature sensors on **Slots 9 through to 15** (depending on how many cylinders you choose to monitor). Each cylinder will require a separate AR temperature probe.



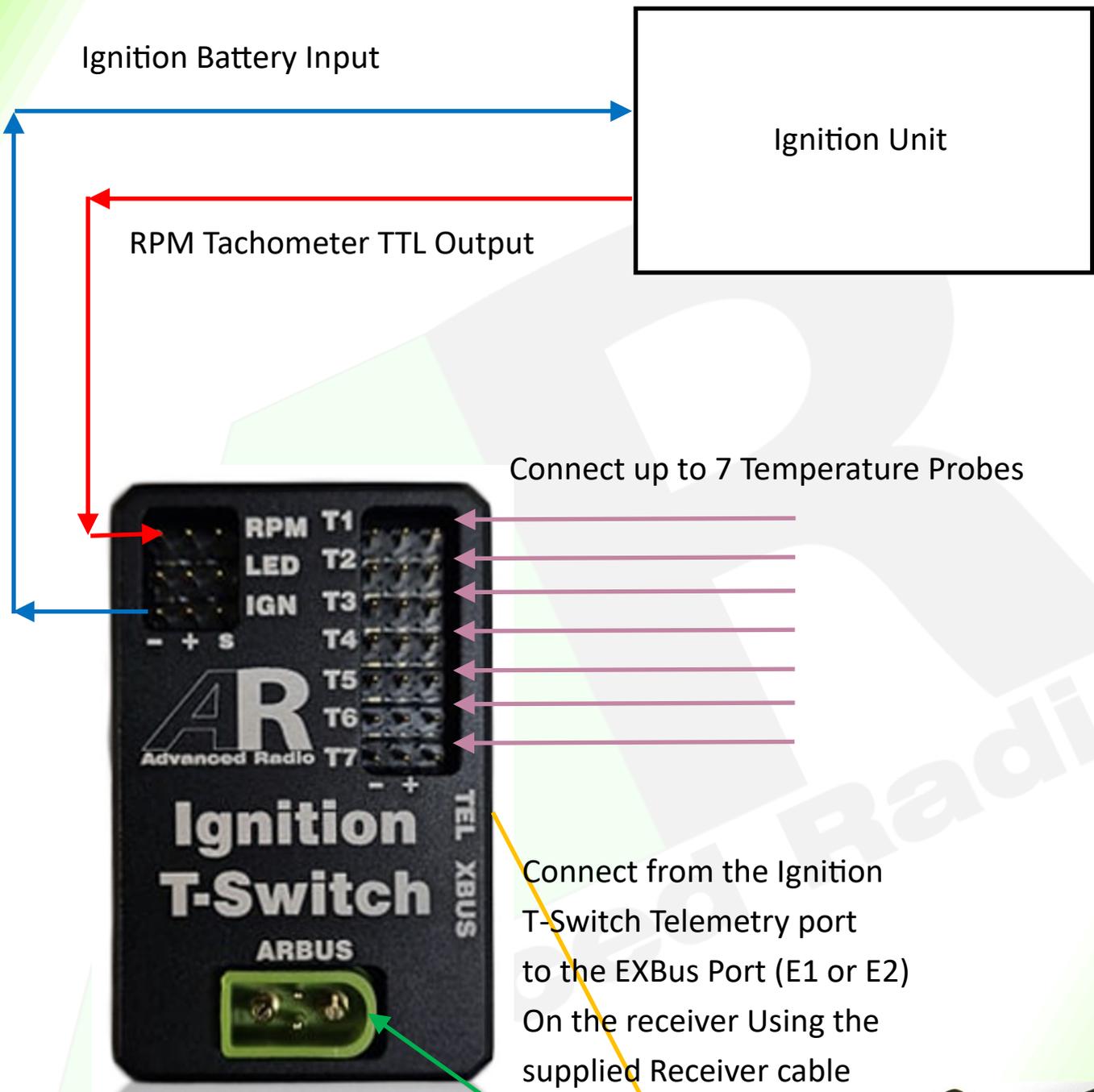
AR TEMPERATURE PROBE MOUNTING ON THE MOTOR

The temperature probes are designed to loop around the highest slot in between the top 2 heat fins of the cylinder. Simply remove the Spark Plug Cap, Loop the temperature probe between the upper 2 fins at the top of the cylinder and snug it in place. DO NOT use too much force as this may break the Thermistor bead in the probe.

HINT

Once snug in place then slide the heat shrink up on the loop and press it into the heat fin slots. After the first run the heat shrink will shrink down and hold the probe in place. The thermistor (Heat Probe) is located at the mid point of the sensor probe. Try to position the heat bead at the bottom or towards the rear of the cylinder. This will give you the best temperature reading. Each motor installation is slightly different so take your time to get the temperature probes in the right place.

Ignition T-Switch Jeti EX Bus Setup



Connect from your chosen receiver Ignition Switch Channel to ARBUS Input using supplied AR1 to JR lead. This will be the IGNITION KILL SWITCH channel



Ignition T-Switch Jeti EXBus Setup

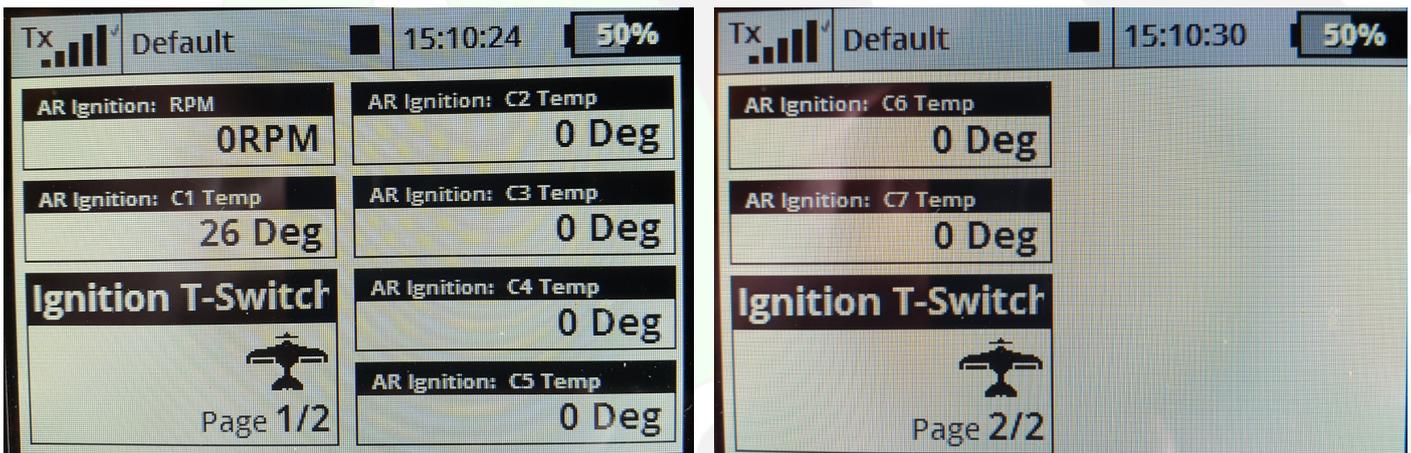
RADIO SETUP

After making connections on the AR Ignition T-Switch you will need to bind the receiver to the TX. After binding go to device explorer and set the E1 or E2 on the receiver to receive EXBus. This is important as telemetry from the Ignition T-Switch is sent using EXBus format. With the receiver bound, power up the model and radio. The Ignition T-Switch will automatically sense the EXBus protocol and start sending telemetry.

Also double check that the ignition kill switch channel matches the receiver output for the AR servo connector. You can now test the ignition kill switch in the TX is switching the Ignition T-Switch. The blue LED will glow when the ignition is active. If necessary you can reverse the Ignition channel in the TX. Please consult your Jeti users manual on how to assign switches to servo outputs.

JETI RADIO TELEMETRY SETUP

The Ignition T-Switch sends native AR telemetry to the Jeti Radio. RPM and all temperature sensors will be available. Simply select what you want to display on the main screen. Depending on how many cylinders you choose the monitor for each cylinder will require a separate AR temperature probe.



Go to the Timers/Sensors page to confirm telemetry is being received and assign the RPM and up to 7 temperatures to be displayed on the main screen

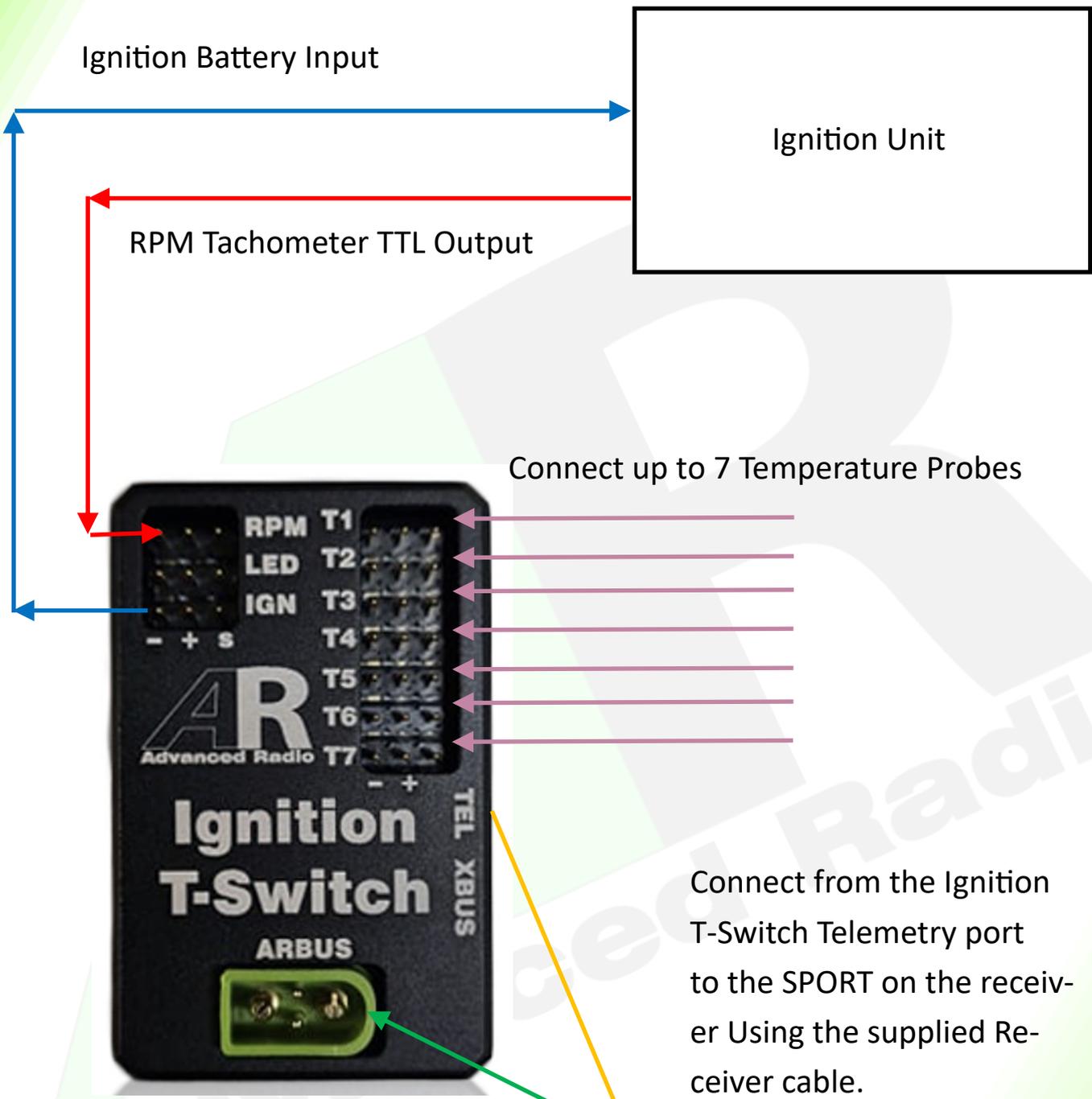
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HINT

Once snug in place then slide the heat shrink up on the loop and press it into the heat fin slots. After the first run the heat shrink will shrink down and hold the probe in place. The thermistor (Heat Probe) is located at the mid point of the sensor probe. Try to position the heat bead at the bottom or towards the rear of the cylinder. This will give you the best temperature reading. Each motor installation is slightly different so take your time to get the temperature probes in the right place.

Ignition T-Switch FRSky SPORT Setup



Connect from your chosen receiver Ignition Switch Channel to ARBUS Input using supplied AR1 to JR lead. This will be the IGNITION KILL SWITCH channel



Ignition T-Switch FRSky SPORT Setup

RADIO SETUP

After making connections on the AR Ignition T-Switch you will need to bind the receiver to the TX. After binding with the receiver bound, power up the model and radio. The Ignition T-Switch will automatically sense the SPORT protocol and start sending telemetry.

Also double check that the ignition kill switch channel matches the receiver output for the AR servo connector. You can now test the ignition kill switch in the TX is switching the Ignition T-Switch. The blue LED will glow when the ignition is active. If necessary you can reverse the Ignition channel in the TX. Please consult your FRSky users manual on how to assign switches to servo outputs.

FRSKY RADIO TELEMETRY SETUP

The Ignition T-Switch emulates native FRSky RPM and temperature probes. To show up to 7 cylinders simultaneously, the engineers at AR append the cylinder number at the front of the temperature value (Example 1080 would be cylinder 1 at 80 degrees. 4122 would be cylinder 4 at 122 degrees). Depending on how many cylinders you choose to monitor, each cylinder will require a separate AR temperature probe.

Go to the Telemetry page and select "Discovery". RPM will show and each temperature probe will display as they are connected.



The screenshot shows the FRSky radio's telemetry screen. At the top right, the date and time are 28 Feb 15:42. Below the title 'TELEMETRY', there is a list of data points. The first seven items are temperature probes for cylinders 5 through 12, each showing a value of 26. The eighth item is RPM, showing 0rpm. The ninth item is a temperature probe for cylinder 9, showing 1027°C. The tenth and eleventh items are temperature probes for cylinders 10 and 11, showing 2026°C and 5026°C respectively. The twelfth item is a temperature probe for cylinder 12, showing 6026°C. At the bottom left, there is a 'Stop discovery' button.

Cylinder	Probe Name	Value	Unit
5:	Tmp1	3026	°C
6:	Tmp1	4026	°C
7:	Tmp1	7026	°C
8:	RPM *	0	rpm
9:	Tmp1 *	1027	°C
10:	Tmp1	2026	°C
11:	Tmp1	5026	°C
12:	Tmp1	6026	°C

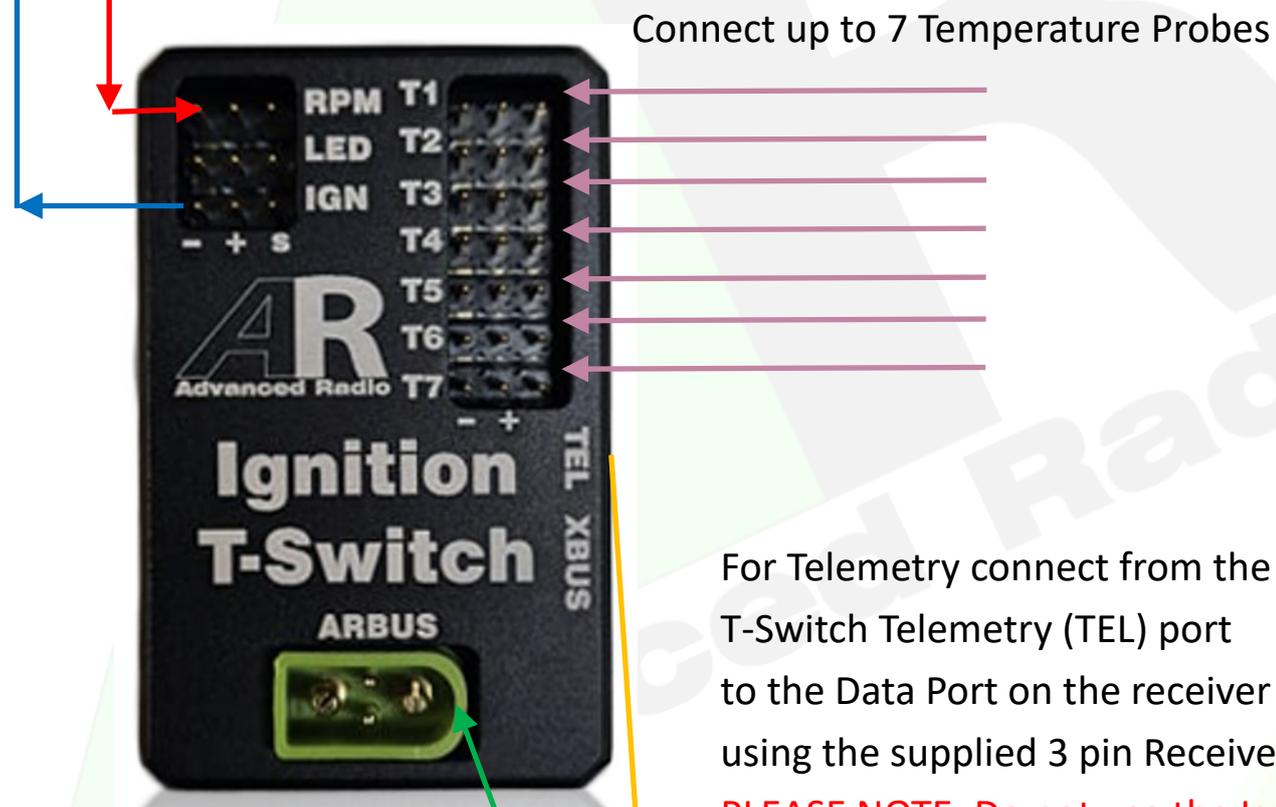
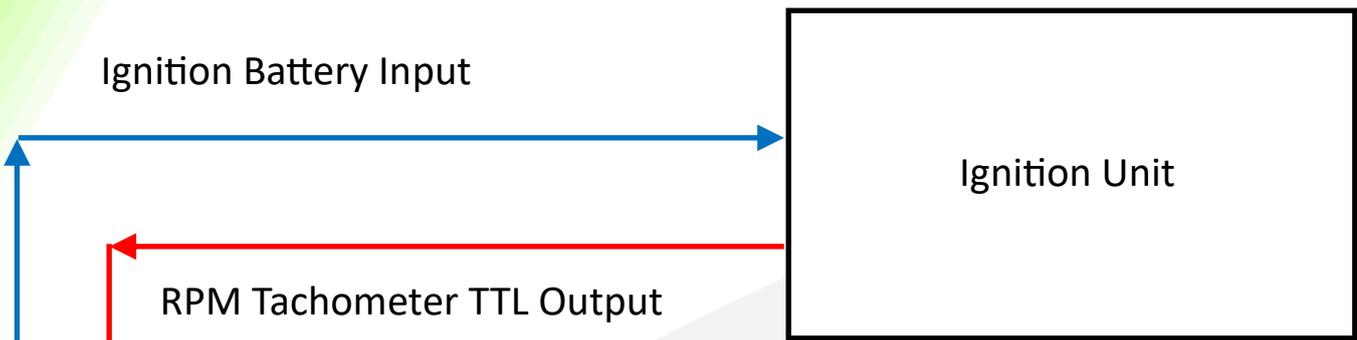
AR TEMPERATURE PROBE MOUNTING ON THE MOTOR

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HINT

Once snug in place then slide the heat shrink up on the loop and press it into the heat fin slots. After the first run the heat shrink will shrink down and hold the probe in place. The thermistor (Heat Probe) is located at the mid point of the sensor probe. Try to position the heat bead at the bottom or towards the rear of the cylinder. This will give you the best temperature reading. Each motor installation is slightly different so take your time to get the temperature probes in the right place.

Ignition T-Switch JR Telemetry Setup



For Telemetry connect from the Ignition T-Switch Telemetry (TEL) port to the Data Port on the receiver using the supplied 3 pin Receiver cable. **PLEASE NOTE: Do not use the Ignition T-Switch XBUS Port as this is for Spektrum receivers only.**



Connect from your chosen receiver Ignition Switch Channel to ARBUS Input using supplied AR1 to JR lead. This will be the IGNITION KILL SWITCH channel

Ignition T-Switch JR XBus Setup

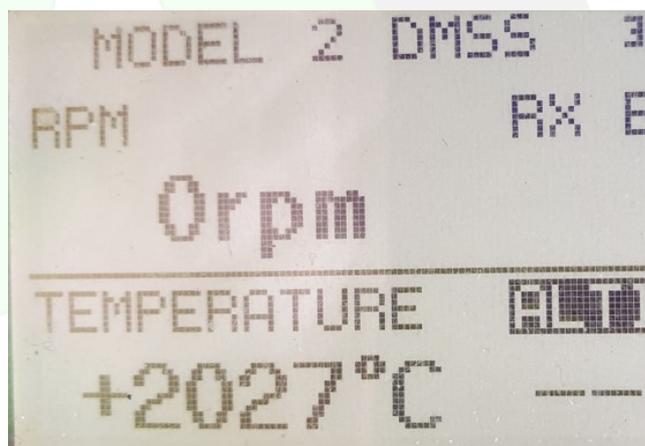
RADIO SETUP

After making connections on the AR Ignition T-Switch you will need to bind the receiver to the TX. After binding, with the receiver bound, power up the model and radio. The Ignition T-Switch will automatically sense the XBus protocol and start sending telemetry.

Also double check that the ignition kill switch channel matches the receiver output for the AR servo connector. You can now test the ignition kill switch in the TX is switching the Ignition T-Switch. The blue LED will glow when the ignition is active. If necessary you can reverse the Ignition channel in the TX. Please consult your JR users manual on how to assign switches to servo outputs.

JR XBus RADIO TELEMETRY SETUP

The Ignition T-Switch emulates native JR RPM and temperature probes. To show up to 7 cylinders simultaneously, the engineers at AR append the cylinder number at the front of the temperature value (Example 1080 would be cylinder 1 at 80 degrees. 4122 would be cylinder 4 at 122 degrees). Some JR radios can only display a single temperature prob so the engineers at AR cycle through the connected temperature probes from lowest to highest and then repeats. Depending on how many cylinders you choose to monitor, each cylinder will require a separate AR temperature probe.



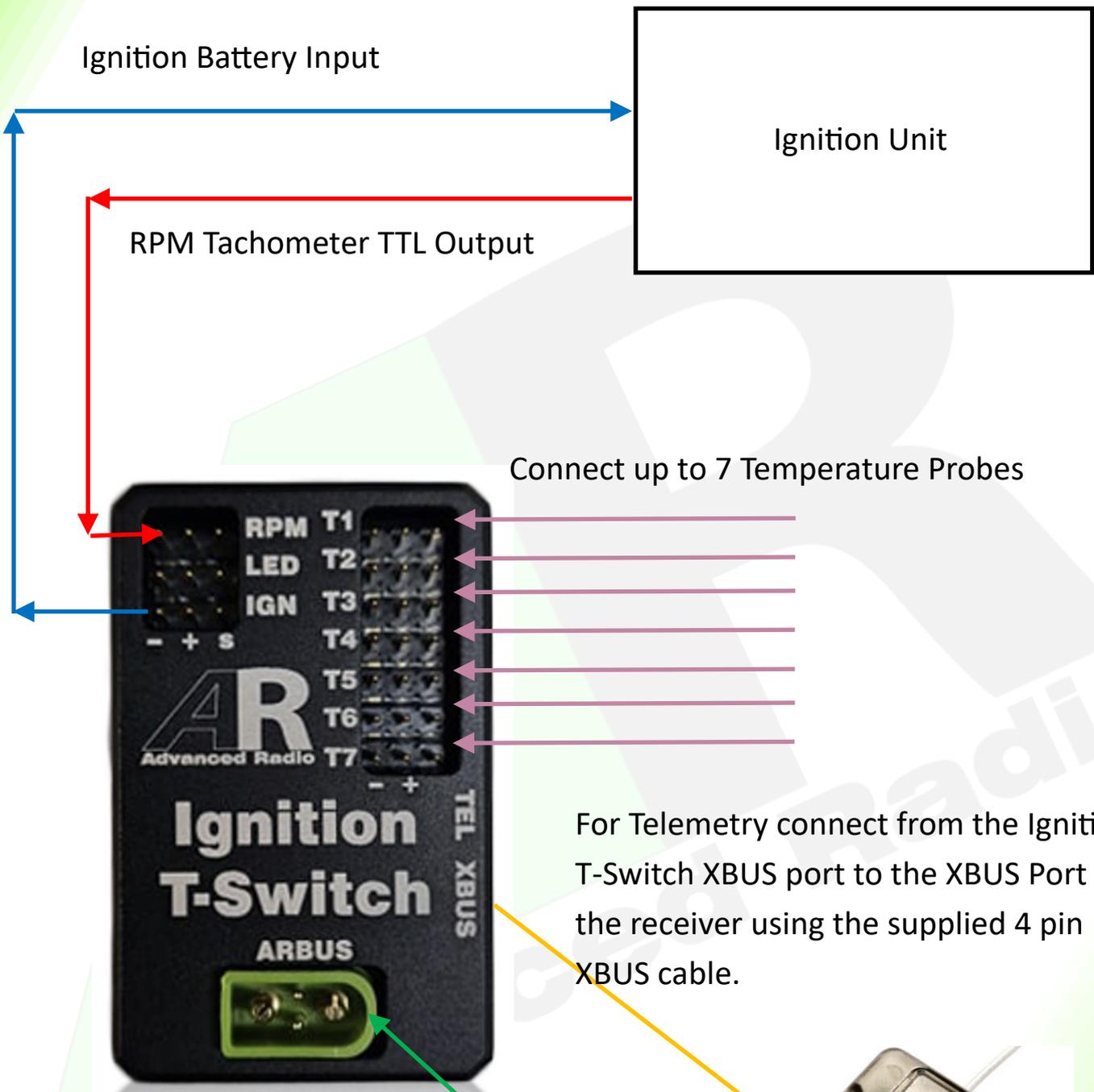
AR TEMPERATURE PROBE MOUNTING ON THE MOTOR

The temperature probes are designed to loop around the highest slot in between the top 2 heat fins of the cylinder. Simply remove the Spark Plug Cap, Loop the temperature probe between the upper 2 fins at the top of the cylinder and snug it in place. DO NOT use too much force as this may break the Thermistor bead in the probe.

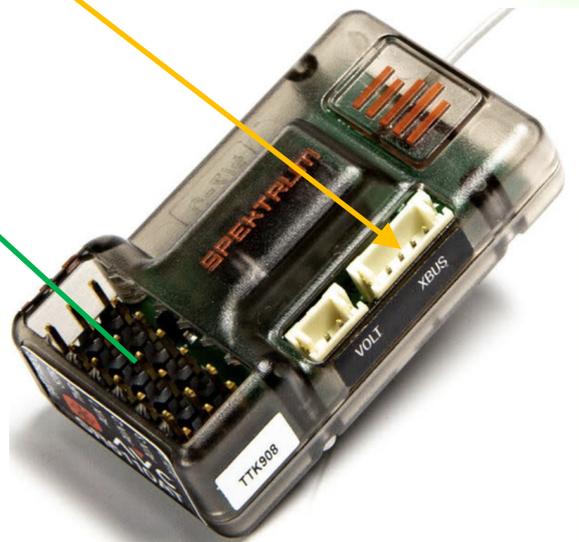
HINT

Once snug in place then slide the heat shrink up on the loop and press it into the heat fin slots. After the first run the heat shrink will shrink down and hold the probe in place. The thermistor (Heat Probe) is located at the mid point of the sensor probe. Try to position the heat bead at the bottom or towards the rear of the cylinder. This will give you the best temperature reading. Each motor installation is slightly different so take your time to get the temperature probes in the right place.

Ignition T-Switch Spektrum XBUS Setup



Connect from your chosen receiver Ignition Switch Channel to ARBUS Input using supplied AR1 to JR lead. This will be the IGNITION KILL SWITCH channel



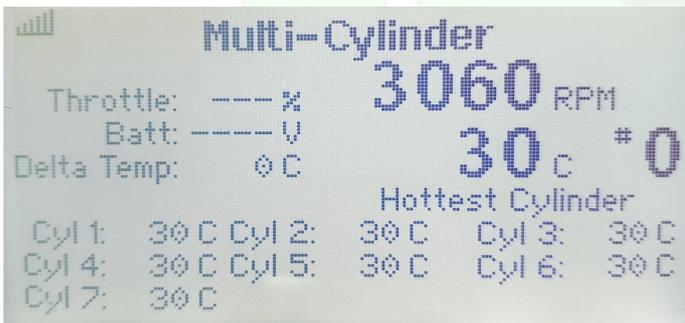
Ignition T-Switch Spektrum XBUS Setup

RADIO SETUP

After making connections on the AR Ignition T-Switch you will need to bind the receiver to the TX then attach the temperature probes to the motor. The Ignition T-Switch will automatically sense the protocol of the radio and start sending telemetry. Double check that the ignition channel matches the receiver output for the AR servo connector. You can now test the ignition kill switch channel in the TX is switching the Ignition T-Switch. The blue LED will glow when the ignition is active. If necessary you can reverse the Ignition channel in the TX.

SPEKTRUM RADIO TELEMETRY SETUP

The Ignition T-Switch emulates the Multi Cylinder telemetry for DX and some NX radios (DX18 etc). It also sends text based information for Spektrum Radios that do not support the Multi Cylinder Radio telemetry format (IX12, IX20 etc). Using the DX18 as an example you will have the option of both Multi Cylinder and Text based telemetry (See screen shots below). Multi cylinder supports RPM and up to 7 cylinders. (Depending on how many cylinders you choose to monitor). Each cylinder will require a separate AR temperature probe.



Multicylinder telemetry shows temperature in degrees C. This is a Spektrum decision and has been set up in the TX by the Spektrum engineers. Please note that the Ignition T-Switch does not send throttle position or battery voltage. It does however show the hottest cylinder and the delta value.



The text based telemetry has been calculated by the AR engineers to show in degrees F. It shows RPM and temperature for up to 7 cylinders. If temperature slots are not populated then the temperature value shows NC (not connected). Maximum temperature for display is 570F (300C)

AR TEMPERATURE PROBE MOUNTING ON THE MOTOR

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HINT

Once snug in place then slide the heat shrink up on the loop and press it into the heat fin slots. After the first run the heat shrink will shrink down and hold the probe in place. The thermistor (Heat Probe) is located at the mid point of the sensor probe. Try to position the heat bead at the bottom or towards the rear of the cylinder. This will give you the best temperature reading. Each motor installation is slightly different so take your time to get the temperature probes in the right place.

Replacement Warranty

At Advanced Radio our products are designed and tested to very high standards. We use only the highest quality electronic components sourced from reputable manufacturers; ST Micro, BOSCH, TDK, Linear Technology, Texas Instruments, Cypress Semiconductor Corp and NPX. Our circuit boards are assembled in Australia in a certified ISO900-2008 and ISO 13485 medical devices risk management quality assurance environment.

At Advanced Radio we understand the value of the models that run our RC division of electronics. During our many years of operation we have focused on and developed a high quality product and reputable testing regime. Our QC process has been developed from many years of experience designing and working in medical systems. We understand completely the processes involved to achieve a very high quality and reliable product.

We believe in our processes and so we are offering a 1 year warranty if found to be defective in material and/or workmanship when used in the intended purpose.

Shipping charges related to any warranty claim are at the expense of the user, but Advanced Radio may elect to cover shipping charges at it's discretion.

Warranty does not cover over voltage or over current damage beyond stated specification. Warranty does not cover damage due to negligence, abuse, accident, improper installation or improper mounting, loss of time, inconvenience, loss of model, or other incidental or consequential damages.

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