Technical Support

TECHNICAL NOTE

TECHNICAL NOTE TN-1078b

TM8000 Connector Pinouts
Quick Reference Guide

25th August 2005

Applicability   This Technical Note applies to the TM8000 series of Radios.

1. Introduction

This document details the pinouts of the various connectors on the TM8000 series of radios. It was produced to be a quick reference guide only. Also noted are the radios link settings LK1 to LK4.

For more in-depth information on the connectors mentioned in this document please refer to the 3DK Service Manual MMAA30-01-00-XXX.

2. Connector Pinouts

Auxiliary

As viewed from the rear of the radio

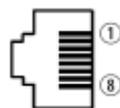| Pin	Name	Description
1	AUX_GPIO7	General purpose I/O, 3V3 CMOS.
2	AUX_GPIO5	General purpose I/O, 3V3 CMOS.
3	AUX_RXD	Receive data, 3V3 CMOS (in to radio).
4	AUX_GPI3	Default setting is Ignition Sense as LK2 is fitted by default. If LK2 is removed this pin can be used as a general purpose input pin. 3V3 CMOS.
5	AUX_GPI2	LK3 is fitted as default to ensure this pin can be used to enter emergency mode from a powered off state. This pin can also be used as a general purpose input at 3V3 CMOS.
6	RSSI	Analogue RSSI output, see 3DK service manual.
7	AUD_TAP_IN	Analogue audio tap in, see 3DK service manual.
8	+13V8_SW	Default setting is a switched +13V8 line. A maximum of 1A can be drawn from all switched lines.
9	AUX_GPIO6	General purpose I/O, 3V3 CMOS.
10	AUX_GPIO4	Default setting is general purpose I/O, 3V3 CMOS. Can be configured as a high current output capable of sinking 2A by fitting Q707 (MTP3055) and removing R768.
11	AUX_TXD	Transmit data, 3V3 CMOS (out of radio).
12	AUX_GPI1	General purpose input, 3V3 CMOS.
13	AUD_TAP_OUT	Analogue audio tap out, see 3DK service manual.
14	AUX_MIC_AUD	Analogue auxiliary mic input, electret mic only.
15	AGND	Analogue ground.

Internal Options

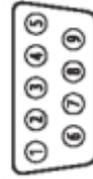

As viewed from the top of the connector

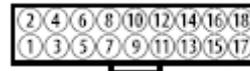| Pin	Name	Description
1	13V8_SW	Default setting is a switched +13V8 line. A maximum of 1A can be drawn from all switched lines.
2	AUD_TAP_OUT	Audio tap out, see 3DK service manual.
3	AGND	Analogue ground.
4	AUX_MIC_AUD	Analogue auxiliary mic input, electret mic only.
5	RX_BEEP_IN	Analogue sidetone input.
6	AUD_TAP_IN	Audio tap out, see 3DK service manual.
7	RX_AUD	Analogue receive audio – after volume control.
8	RSSI	Analogue RSSI output, see 3DK service manual.
9	IOP_GPIO1	General purpose I/O, 3V3 CMOS.
10	IOP_GPIO2	General purpose I/O, 3V3 CMOS.
11	IOP_GPIO3	General purpose I/O, 3V3 CMOS.
12	IOP_GPIO4	General purpose I/O, 3V3 CMOS.
13	IOP_GPIO5	General purpose I/O, 3V3 CMOS.
14	IOP_GPIO6	General purpose I/O, 3V3 CMOS.
15	IOP_GPIO7	Default is general purpose I/O, 3V3 CMOS. This pin can be configured as power sense (Internal) by fitting LK4.
16	DGND	Digital ground.
17	IOP_RXD	Receive data, 3V3 CMOS (in to radio).
18	IOP_TXD	Transmit data, 3V3 CMOS (out of radio).

Microphone

As viewed from the front of the control head

Pin	Name	Description
1	MIC_RX_AUD	Analogue receive audio output – low-level – can be used for a headset.
2	+13V8	Default setting is a switched +13V8 line. A maximum of 1A can be drawn from all switched lines.
3	MIC_TXD	Transmit data, 3V3 CMOS (out of radio).
4	MIC_PTT	PTT input from microphone, also used for hookswitch signal.
5	MIC_AUD	Analog mic input, default is an electret mic. A dynamic mic can be used providing a TMAA02-06 is fitted in the control head, or Mic Gain is set as High in the TM8100 PC App.
6	AGND	Analogue ground.
7	MIC_RXD	Receive data, 3V3 CMOS (in to radio).
8	MIC_GPIO1	General purpose I/O, 3V3 CMOS. Called CH_GPIO1 in the PC App.

TM8105 DB9

As viewed from the front of the connector

Pin	Name	Description
1	PRG_RX_AUD	Analogue receive audio – after volume control.
2	PRG_TXD	Transmit data, 3V3 CMOS (out of radio).
3	PRG_MIC_AUD	Analogue electret mic input.
4	PRG_RXD	Receive data, 3V3 CMOS (in to radio).
5	PRG_ON_OFF	Power on/off.
6	+13V8	Default setting is a switched +13V8 line. A maximum of 1A can be drawn from all switched lines.
7	PRG_PTT	PTT input from microphone, also used for hookswitch signal.
8	AGND	Analogue ground.
9	DGND	Digital ground.

Control Head

As viewed from the front of the connector

Pin	Name	Description
1	RX_AUD	Analogue receive audio – after volume control.
2	+13V8	Default setting is a switched +13V8 line. A maximum of 1A can be drawn from all switched lines.
3	CH_TXD	Transmit data 3V3 CMOS (out of radio).
4	CH_PTT	PTT input from microphone, also used for hookswitch signal.
5	CH_MIC_AUD	Analogue electret mic input.
6	AGND	Analogue ground.
7	CH_RXD	Receive data 3V3 CMOS (in to radio).
8	DGND	Digital ground.
9	CH_ON_OFF	Power on/off.
10	VOL_WIP_DC	Analogue DC signal provided from volume pot wiper in control head.
11	CH_SPI_DO	Data output signal, 3V3 CMOS.
12	CH_LE	Latch enable output signal, 3V3 CMOS.
13	CH_GPIO1	General purpose I/O, 3V3 CMOS.
14	+3V3	+3V3 power supply output.
15	CH_SPI_DI	Data input signal, 3V3 CMOS.
16	CH_SPI_CLK	Clock output, 3V3 CMOS.
17	SPK-	Speaker audio, balanced output.
18	SPK+	Speaker audio, balanced output.

Telemetry Head TM8252

As viewed from the front of the connector

Pin	Name	Description
1	RX_AUDIO	Analogue receive audio – after volume control.
2	13V8	Default setting is a switched +13V8 line.
3	TXD	Transmit data, 3V3 CMOS.
4	PTT	PTT input from microphone, also used for hookswitch signal.
5	MIC AUDIO	Analogue electret mic input.
6	AGND	Analogue ground
7	RXD	Receive data, 3V3 CMOS.
8	ON/OFF	Radio on/off control.

As used in the TMAC30-0T Blank Head (TM8252). This product has a green LED visible through the front panel when powered-on.
Uses the 220-01720-xx PCB but the second RJ-45 socket is not functional.

Enhanced Remote Kit

As viewed from the front of the connector

Pin	Name	Description
1	RX_AUDIO	Analogue receive audio – after volume control.
2	13V8	Default setting is a switched +13V8 line.
3	RS485+	RS485 data.
4	AGND/PTT	Default setting is analogue ground.
5	MIC AUDIO	Analogue electret mic input.
6	RS485-	RS485 data.
7	DGND	Digital ground.
8	ON/OFF	Radio on/off control.

As used in the TMAA03-19 (TM8200) and TMAA03-08 (TM9100). This applies to both sockets on the torso interface and the socket on the control-head interface. This product has a green LED visible through the front panel when powered-on. Uses the 220-01720-xx PCB.

Basic Remote Kit

As viewed from the front of the connector

| Pin	Name	Description
1	ON/OFF	Radio on/off control.
2	13V8	Default setting is a switched +13V8 line.
3	RS485+	RS485 data.
4	AGND	Analogue ground.
5	MIC AUDIO	Analogue electret mic input.
6	RS485-	RS485 data.
7	SPKR-	Speaker audio, balanced output.
8	SPKR+	Speaker audio, balanced output.

As used in the TMAA03-16 (TM8200) and TMAA03-25 (TM9100). This applies to the socket on the torso interface and on the control-head interface. This product has a red LED visible through the front panel when powered-on. Uses the 220-02123-xx PCB.

3. Link Settings

Link Settings

The TM8000 has several hardware link settings that control various options of power sense in the radio. For more comprehensive information on the link settings see 'Configuring the hardware links LK1 to LK4' in the 3DK service manual MMAA30-01-00-XXX.

The image below shows how the links relate to the radios operation.
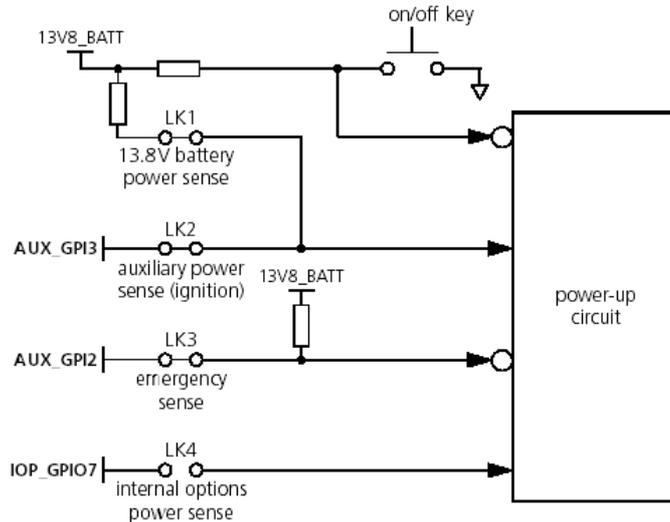
The table below shows the configuration information for each individual link.

Power sense option	Links required	Configuration of remaining links and use of AUX_GPI3 and IOP_GPIO7	Voltages required
13.8V battery sense	LK1 in	LK2 in: AUX_GPI3 must be left floating. LK2 out: AUX_GPI3 can be used as GPI[a].	$10.8V \leq supply \leq 16V$
	LK4 out	IOP_GPIO7 can be used as GPIO.	
auxiliary power sense	LK2 in	LK1 in: Input line must sink <1 mA from AUX_GPI3 (which is pulled to 13.8V by a 33 kΩ resistor). LK1 out: Input line must be active high[b].	AUX_GPI3 ≤0.7V off AUX_GPI3 ≥2.6V high (active) ignition-sense tolerant to 3.3V, 5V and 12V
	LK4 out	IOP_GPIO7 can be used as GPIO.	
internal power sense	LK1 out		IOP_GPIO7 ≤0.7V off IOP_GPIO7 ≥2.6V high (active) ignition-sense tolerant to 3.3V and 5V only
	LK2 out	AUX_GPI3 can be used as GPI.	
	LK4 in	With LK4 in, the input line must be active high[c].	
no power sense	LK1 out		$10.8V \leq supply \leq 16V$
	LK2 out	AUX_GPI3 can be used as GPI.	
	LK4 out	IOP_GPIO7 can be used as GPIO.	

a. If LK2 is out and AUX_GPIO is not used, R775 (33k) should be placed to ensure that AUX_GPI3 does not float (R775 is NOT placed by factory default).
b. If LK1 is out and R775 is placed, AUX_GPI3 should be driven low as well.
c. If LK4 is in and R723 is placed, IOP_GPIO7 should be driven low as well. (R723 is placed by factory default).

Factory Default

Factory Default settings for the hardware links are:
LK1 – Fitted
LK2 – Fitted
LK3 – Fitted
LK4 – Not Fitted

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CSO Instruction   None

4.   Issuing Authority

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