

# Grounding and shielding of the Acra KAM-500

TEC/NOT/063

**CURTISS -  
WRIGHT**

This technical note describes the recommendations for grounding and cable shielding of the Acra KAM-500.

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## 36.1 Star point

The star point is a common point for all grounds on the aircraft or vehicle. It is the designated reference point for all voltages and signals.

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**NOTE:** Due to the low impedance of most aircraft structures, the star point can be the whole airframe.

## 36.2 Acra KAM-500 isolated grounds

The Acra KAM-500 has the following three grounds:

- **GND:** Acra KAM-500 internal electrical ground
- **CHASSIS:** Acra KAM-500 mechanical ground
- **POWER(-):** 28V return

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**NOTE:** All three grounds are isolated from one another inside the Acra KAM-500.

CHASSIS is the signal name to differentiate it from the physical Acra KAM-500 chassis (metal work).

### 36.2.1 GND

GND is the zero volt line that all Acra KAM-500 internal signal conditioning modules use. All input and output signals on Acra KAM-500 modules are referenced to this potential. This signal point is normally taken out to the connector on the top of each Acra KAM-500 module (if available) and is usually pin 51. The GND point is also available on the Acra KAM-500 Power Supply Unit (PSU) connectors.

### 36.2.2 CHASSIS

Each Acra KAM-500 KAD module also has a CHASSIS pin available; this pin is connected to the Acra KAM-500 chassis.

The signal is taken out to the connector on the top of each Acra KAM-500 module (if relevant) and also to some of the PSU connectors (depending on the chassis type). The ground mounting bolt on the top of the PSU is also connected to this signal point and to the chassis.

### 36.2.3 POWER(-)

POWER(-) is the return line for the 28V Acra KAM-500 power supply.

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**NOTE:** The POWER(-) pin is not connected to the CHASSIS line or GND line within the Acra KAM-500.

### 36.3 Acra KAM-500 grounding

Each isolated ground signal should be connected to the main star point on the aircraft or vehicle using a low impedance connection. Hence the GND pins on the Acra KAM-500 PSU connector, the CHASSIS pin on the PSU connector (if available) and the POWER (-) pin on the PSU connector should be connected directly to the star point. If the PSU connector has several GND and/or CHASSIS pins, then one of each should be used. It is acceptable to use the ground mounting bolt on the PSU instead of the CHASSIS pin. A common cable should not be used to take more than one of these signals to the star point.

**NOTE:** When more than one Acra KAM-500 is used, each Acra KAM-500 should be connected to the star point using individual cables. Shared cables should not be used.

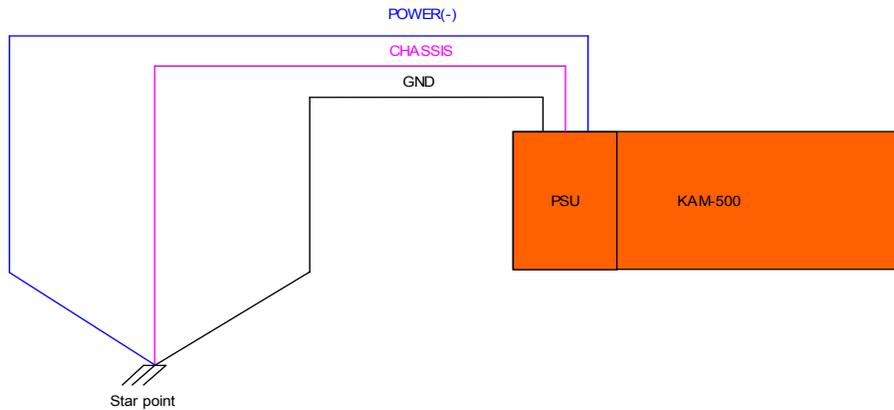


Figure 36-1: Acra KAM-500 grounding

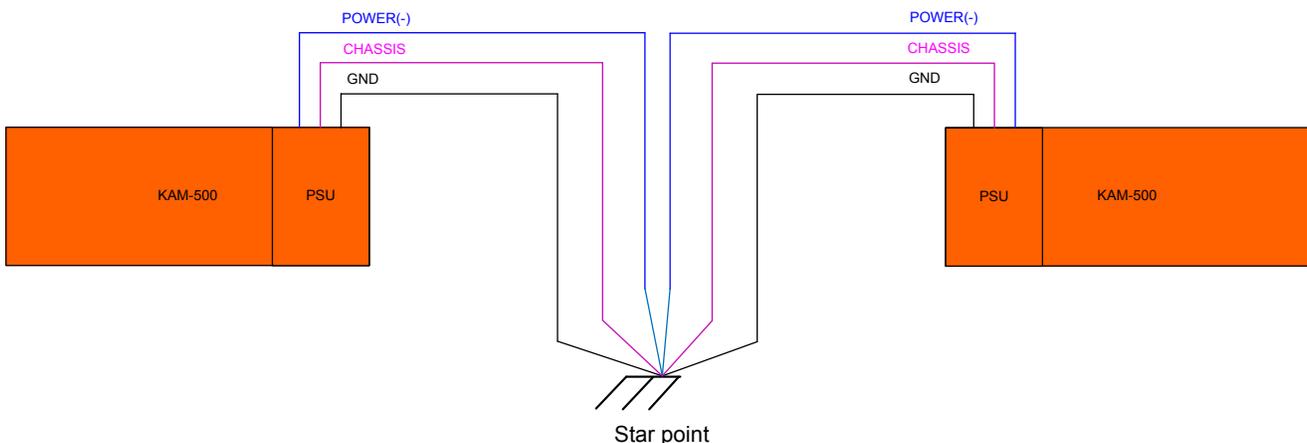


Figure 36-2: Grounding for multiple chassis

### 36.4 Validating grounding

After connecting the grounds, measure the resistance between each GND point, CHASSIS point and POWER (-) on each Acra KAM-500 to the star point. The resistance should be below 50 mΩ.

### 36.5 Cables and shielding

All cables should be shielded and the shields connected to the Acra KAM-500 through the connector backshells. If the backshells have shield terminations then use these, otherwise bend the shields back and clamp under the cable clamp. The alternative method is to use a short pig-tail and take this to the CHASSIS pin on the Acra KAM-500 connector; this method is acceptable but it is not the preferred method as it may result in a short length of unscreened signal cable.

Signal cable shields should ideally only terminate at the Acra KAM-500 end. Bus cables may terminate at both ends as stated in the relevant bus specification document.

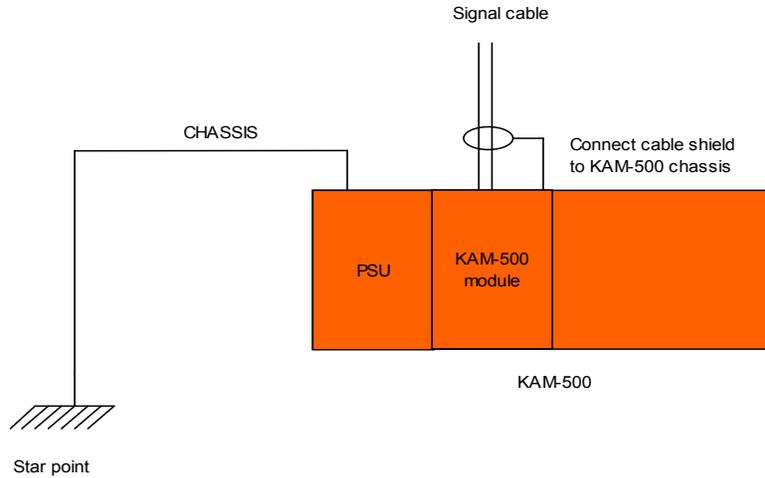


Figure 36-3: Shielding

ACRA CONTROL recommends the use of twisted pairs with an overall foil shield. Wires should ideally be silver plated.

## 36.6 Incorrect configurations

### 36.6.1 Incorrect Acra KAM-500 grounding

Any two or all three of the ground station signals should not share a common cable to the star point as shown in Figure 36-4 on page 3 and Figure 36-5 on page 4 respectively.

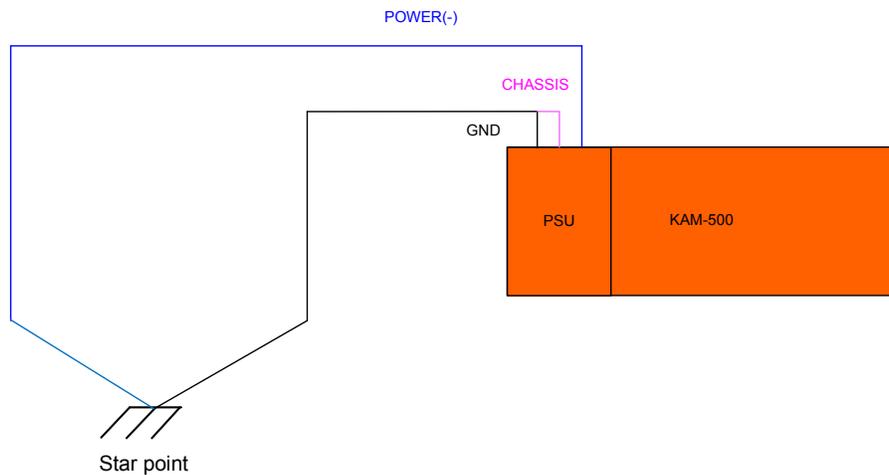


Figure 36-4: POWER(-) return and GND using the same ground

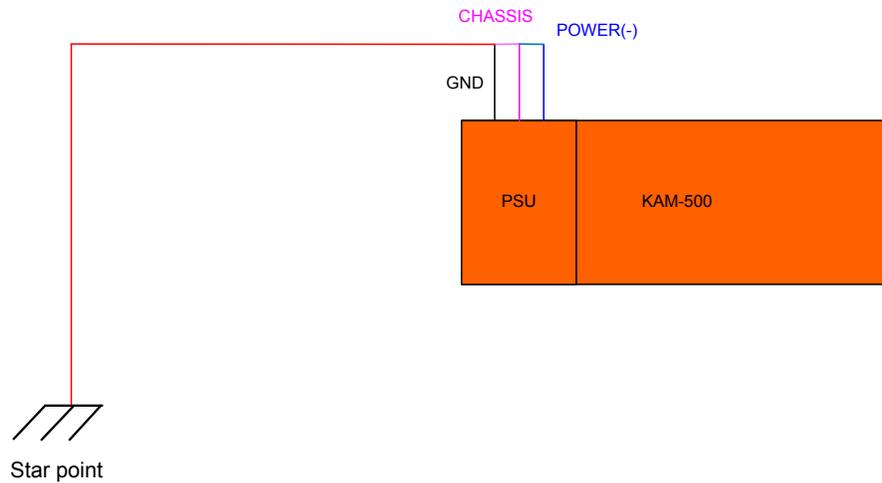


Figure 36-5: POWER(-) return, CHASSIS and GND using the same ground

### 36.6.2 Incorrect star grounding for multiple chassis

If multiple Acra KAM-500s are used, then all ground signals should be taken back to the star point and no two chassis should share common cables for the GND, POWER(-) or CHASSIS signals.

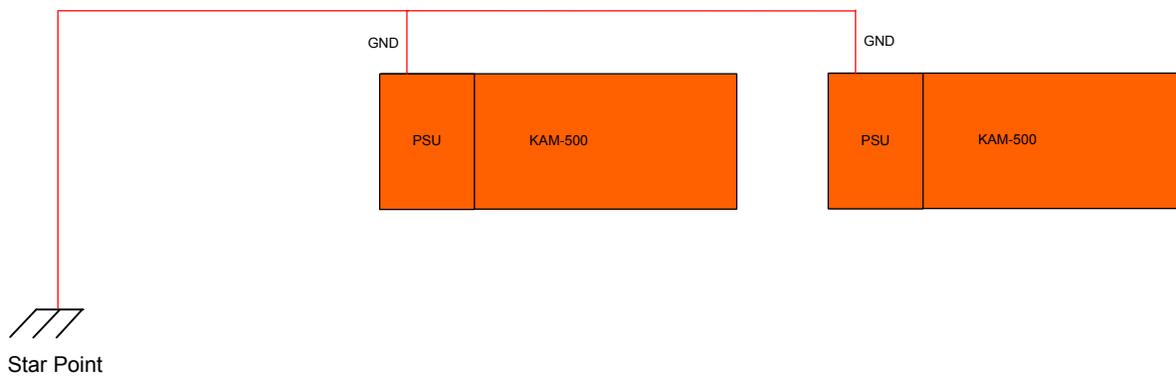


Figure 36-6: Example of incorrectly connecting the GND signals of two chassis

## 36.7 Glossary

**Ground** - a common reference point for all electrical signals in a circuit.

**Shield** - a conductive layer around a cable that encloses signal carrying wires. The shield is used to attenuate any incoming or radiated electromagnetic noise.