ACCI-01

Version 1.2

User's Manual

AC CURRENT INTERFACE

Version 1.1

User's manual

PROPRIETARY INFORMATION

Document name: UMACCI01012
Issue: 1.2
Revised by: E. Boivin
Date: 2009/09/24

TABLE OF CONTENTS

FIGURES:

CONTROL SHEET

ISSUE	DATE	DESCRIPTION	ORIGINATOR
1.0	2000/08/10	First release	K. Simard G. Watelle
1.1	2001/03/20	Review	J. Lavallée F. Dionne
1.2	2009/09/24	Information Analog Outputs 3.5VAC	E. Boivin

1. GENERAL INFORMATION

1.1 Purpose

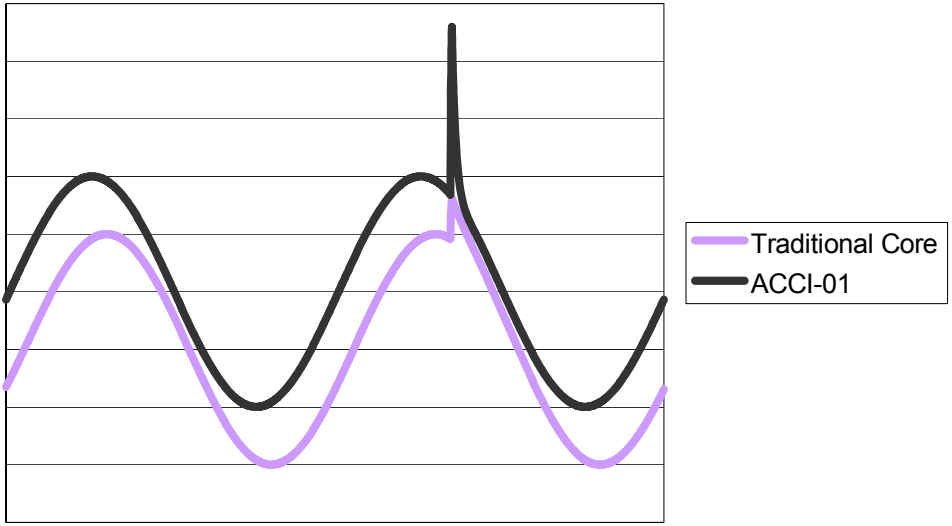
The AC Current Interface is designed to measure AC current from a current carrying conductor. The AC Current Interface then scales the measurement to a level compatible with MULTITEL's monitoring equipment.

1.2 Application

AC current data is central to analyzing a power plant's behavior. It helps both engineering and provisioning personnel to diagnose the onset of potential problems before they become critical conditions. The AC Current Interface is also useful to network surveillance personnel and repair technicians, as they can be warned instantly of a commercial AC outage.

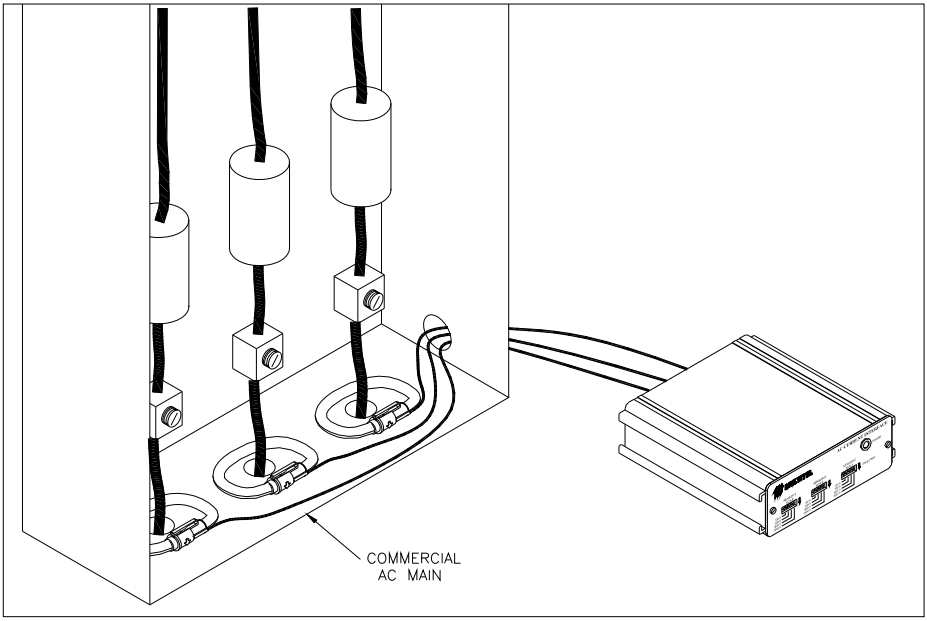
The AC Current Interface uses a flexible-core sensor, which offers better bandwidth, flexibility, and a larger current range than traditional sensors. The AC Current Interface's advanced design also enables a more accurate detection of current transients, hence improving the possibility of early diagnosis and proactive corrective actions.

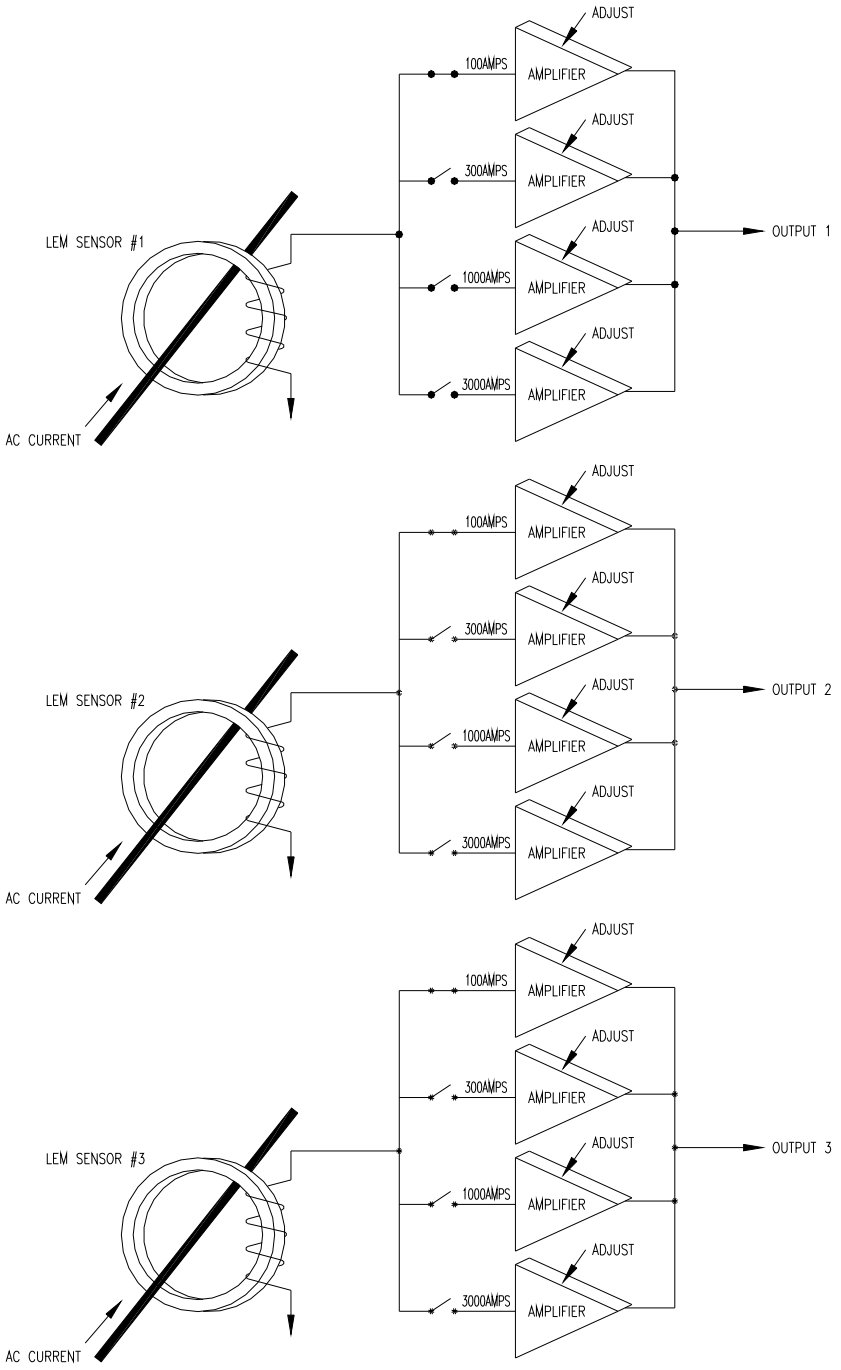
Figure 1 – Current transient detection by traditional cores versus the AC Current Interface



Moreover, the AC Current Interface's easy-to-install sensor allows for bigger conductors to be monitored – up to 7,6 inches in diameter (19,4 cm). It also provides for three sensors to be used with each control unit, for the three-phase monitoring of AC current.

Figure 2 – Application Schematics




LEM SENSOR #1
AC CURRENT
100AMPS
300AMPS
1000AMPS
3000AMPS
ADJUST
AMPLIFIER
OUTPUT 1
LEM SENSOR #2
AC CURRENT
OUTPUT 2
LEM SENSOR #3
AC CURRENT
OUTPUT 3

2. COMPONENTS

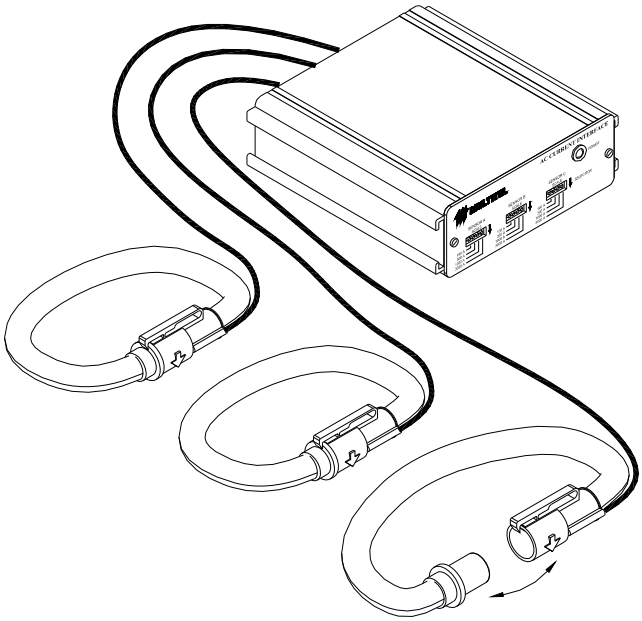
2.1 General Description

The AC Current Interface is composed of two main parts: the sensor(s) and the control unit.

Up to three sensors may be used with an AC Current Interface. Each flexible-core sensor is installed around a current carrying conductor and monitors AC current. The sensor then send the measurement to the AC Current Interface's control unit.

The control unit is used to select the desired current range and to process the AC current measurements coming from the flexible-core sensor. The control unit also scales the measurement to a level compatible with the analog inputs on MULTITEL's monitoring products. It is then sent to a MULTITEL monitoring product, where it can be stored in a statistics file, used to activate alarms, or for advanced calculations.

Figure 3 – AC Current Interface physical aspect



2.2 Summary of Specifications

MECHANICAL SPECIFICATIONS		
Flexible-core sensor	Length	60,96 cm (24”)
	Diameter	2,23 cm (0.9”)
	Free space inside the sensor	19,4 cm (7.6”)
Control unit	Length	13,46 cm (5.3”)
	Width	11,68 cm (4.6”)
	Height	3,81 cm (1.5”)

ELECTRICAL SPECIFICATIONS	
AC current range	100A / 300A / 1000A / 3000A
Power supply	18 to 60Vdc
Accuracy	1 %
Sensor operating voltage	600 VAC
Cutoff frequency	5 kHz
Analog Outputs	3.5 VAC

ENVIRONMENTAL SPECIFICATIONS	
Operating temperature	0°C to 70°C (32°F to 212°F)
Storage temperature	0°C to 70°C (32°F to 212°F)
Temperature effect on sensor accuracy	0.05 %
Operating humidity	0 to 95 % (non-condensing)
Storage humidity	0 to 95 % (non-condensing)
Pollution degree	2
Altitude	61 meters (200 feet) below sea level to 3,962 meters (13,000 feet) above sea level.

2.3 Certifications

Your AC Current Interface has been designed and has met the strictest of certifications:

- CSA-US (UL equivalent).
- CSA

3. INSTALLATION

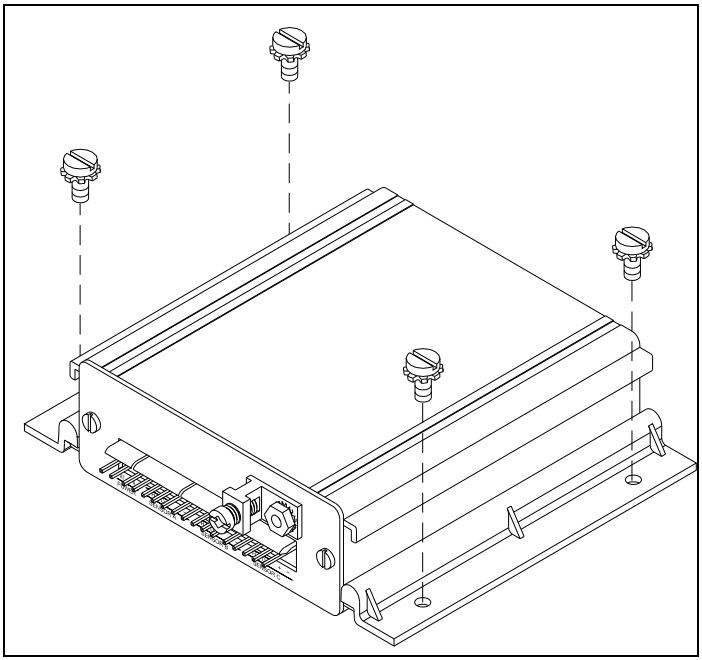
NOTE:
➢This product is for indoor use only.

Your AC Current Interface is very easy to install. Simply follow the following instructions. Begin by assembling all tools and hardware necessary for completing this installation:

A. Wire strippers
B. Crimping tool (part #90123-2) for AMP Connectors
C. Necessary hardware for unit mounting with the standard brackets if applicable.
D. Optional rack mount kit and/or seismic sensor installation kit if applicable.
E. Two-conductor shielded cable
F. Cable ties
G. Digital Volt Meter (DVM)

3.1 Mounting the Control Unit Using the Standard Brackets

Figure 4 – Mounting the unit



1. Locate the flat surface where the control unit will be mounted. Allow enough clearance at the rear of the unit for mating portion of the rear connectors. Keep in mind that the flexible-core sensor's wire is 2 meters long (6 feet).
2. Place the control unit where it will be mounted permanently. Hold firmly. Place a bracket into either slot. The central unit and bracket are small enough to hold with one hand. While aligning the bracket and central unit, mark the positions of the mounting holes.
3. Place the bracket in the other slot of the unit. Mark the positions of the mounting holes as previously done.
4. Use appropriate hardware for your particular application to fasten the brackets of the central unit to the flat surface. Do not tighten the fasteners completely. Leave the hardware loose, allowing the brackets to

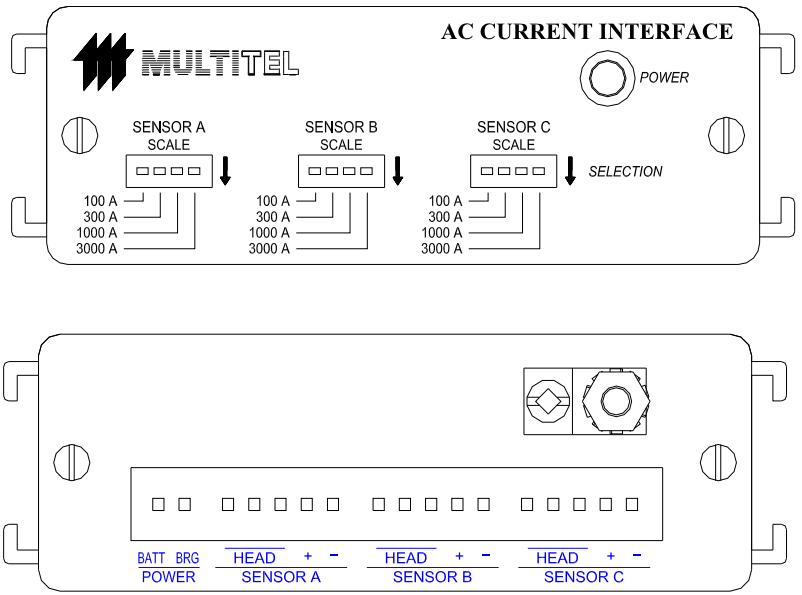
move enough for removal and replacement of the control unit. Validate that the control unit can be installed and removed from its final installation location.

5. If there is unconstrained access to the rear of the unit, you may choose to install the control unit permanently by placing it under the loose brackets and systematically tightening the fasteners in a crisscross pattern (to produce equal stress on the mechanical housing of your AC Current Interface).
6. If access is not available to the rear of the control unit when installed, temporarily leave it and continue with the installation process.

3.2 Installing the ACCI-01 Sensor(s)

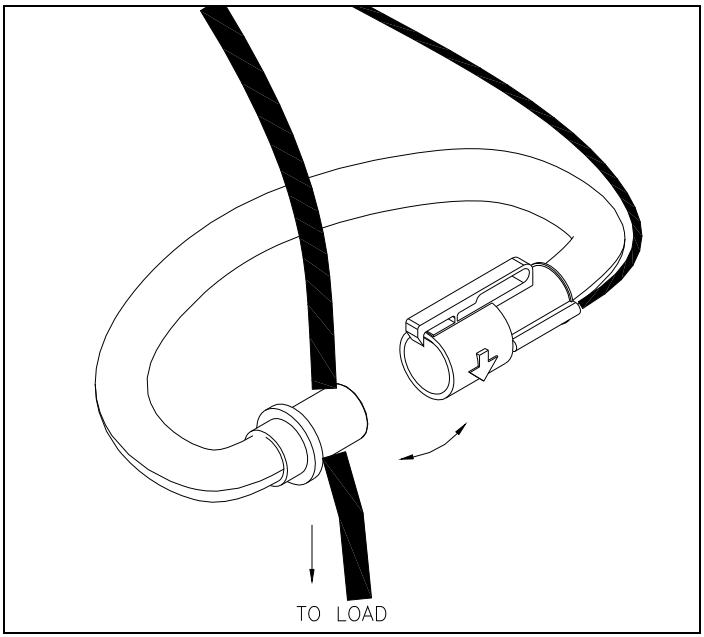
1. On the control unit's front panel, select the Amperage scale to be monitored by sensor A by putting the appropriate switch in the "SELECTION" position (pointing down), while the remaining switches for the sensor are left in their original position (pointing up). Repeat for sensors B and C if applicable.

Figure 5 – AC Current Interface front and back panels



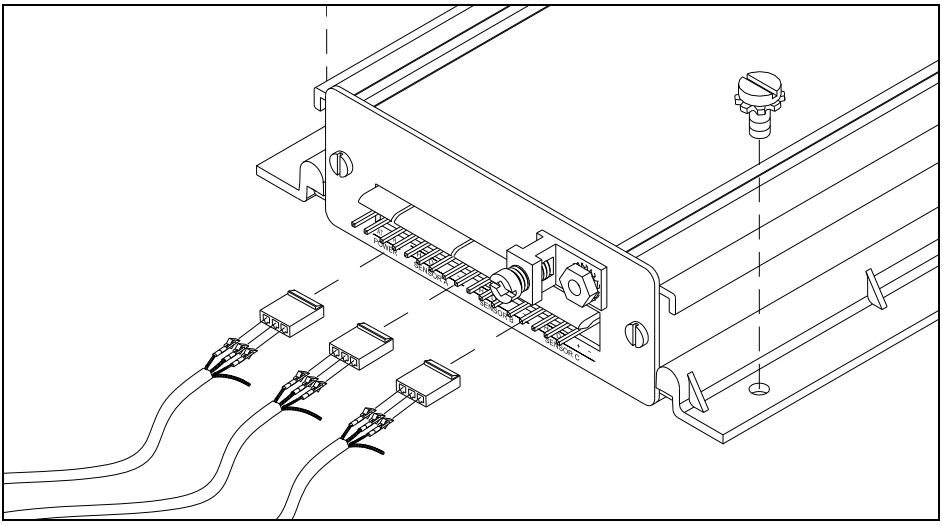
7. Locate the conductor(s) the AC Current Interface flexible-core sensor(s) will be installed around.
8. Open a AC Current Interface flexible-core sensor:

Figure 6 – Installing the sensor



9. Install the flexible-core sensor(s) around the conductor(s), paying close attention to pointing the arrow on the sensor towards the load.
10. Close the AC Current Interface flexible-core sensor, making sure to have the current carrying conductor inside the flexible-core sensor.
11. AC Current Interface sensors come with 2 meters (6 feet) of shielded cable preinstalled from the flexible-core sensor to the termination connectors, leaving the ground conductor apart and loose. Route the sensor cable(s) to where the central unit will be mounted. If access to the rear of the control unit is restricted, be sure to leave enough cable length to attach the sensor connector(s) to the rear of the control unit and then to slide the complete assembly into its final installation position. Secure using cable ties.

Figure 7 – Inserting the sensor connectors



3.3 Wiring a Power Cable to the AC Current Interface

1. Locate the voltage source to power the AC Current Interface control unit. Using a DVM, verify that the voltage difference between the polarities is between 18 and 60 volts DC.

   NOTE: If the desired voltage source is outside the range of 18 to 60 volts DC, and/or the voltage source is AC, install the appropriate MULTITEL power adapter kit. Please refer to the instruction sheet included with this kit.

2. Using shielded cable, route from the control unit's mounting location to the located and verified voltage source. If access to the rear of the control unit is restricted, be sure to leave enough cable length to attach the power connector to the rear of the control unit and then to slide the complete assembly into its final installation position. Leave enough cable length to allow connection to the power source.
3. Permanently secure the cable run with cable ties.

4. Install inline fuse holders to the power source end of the shielded cable. The fuses should be as close to the power source as possible. Leave the fuses themselves out of the fuse holder temporarily. Place the fuses somewhere safe where they can be found later.
5. Permanently connect the power source cable to the power source, paying close attention to polarity. Be sure to connect the cable ground to a good system ground connection close to the utilized power source.
6. Turn your attention to the control unit end of the cable. Strip only enough insulation and shield from the cable as necessary to crimp the connector pins and install the connector housing.

NOTE: To maintain the lowest emissions, the cable shield needs to come to the base of the connector housing. Therefore, it is critical to only strip away as much insulation as needed to install the connector pins and housing.

7. Using the tool, permanently crimp the pins to the wires exposed at the end of the shielded cable to go to the control unit. Slide the crimped wires into the connector housing, making sure to observe the correct polarity and to leave the ground conductor free.
8. Return to the fuse holders and install the fuses temporarily removed earlier.
9. Plug the connector housing into the control unit and verify that the unit becomes active. Remove the connector from the control unit and continue the installation.

Figure 8 – Inserting the power connector

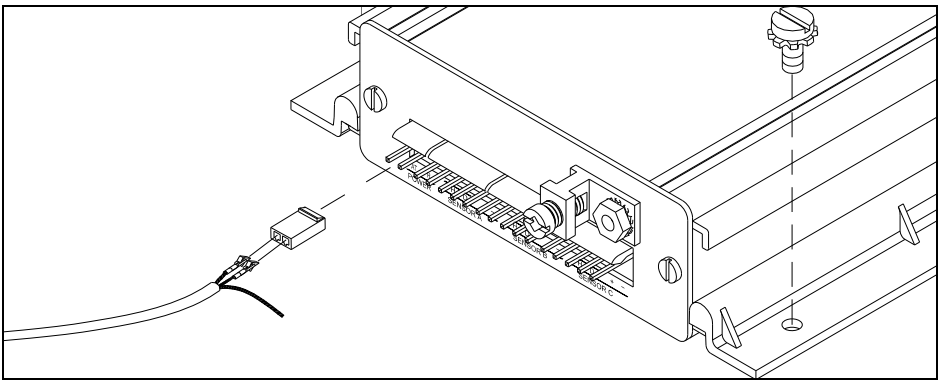
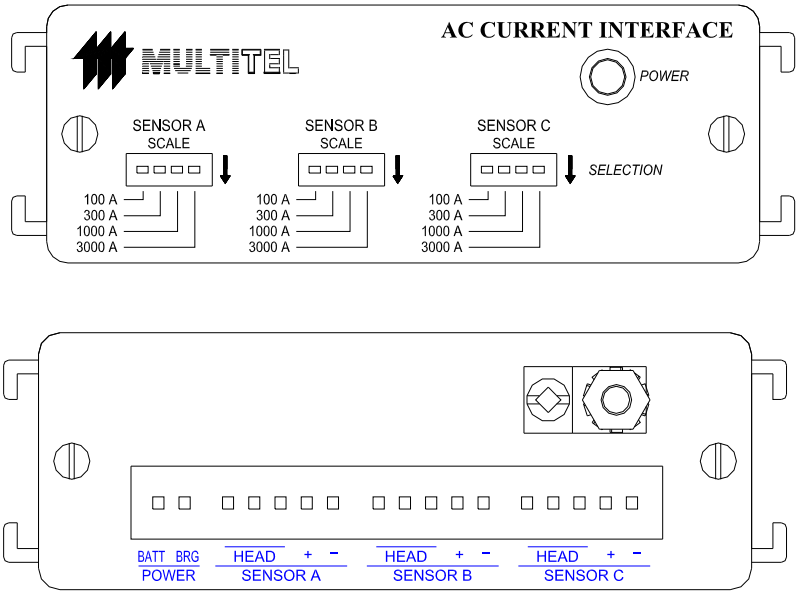


Figure 9 – AC Current Interface front and back panels



3.4 Wiring the Analog Outputs

IMPORTANT NOTE: The Analog Outputs are not isolated from the power supply. Check thoroughly that the inputs utilized on the monitoring equipment are fully isolated. A digital voltmeter has fully isolated inputs.

1. For each Analog Output, use a single shielded cable to connect the AC Current Interface to the monitoring equipment. Route the cables in the best possible configuration for your particular application. If access to the rear of the control unit is restricted, be sure to leave enough cable length to attach the Analog Output connector(s) to the rear of the control unit and then to slide the complete assembly into its final installation position. Leave enough cable length to allow connection to the monitoring equipment's inputs.
2. Permanently secure the cable run(s) with cable ties.

3. Make the applicable connections to the monitoring unit's inputs. Be sure to pay close attention to polarity. Refer to the monitoring unit's installation manual for any questions on connections. Connect the grounding conductor to a good system ground connection close to the monitoring unit's inputs.
4. Turn your attention to the control unit end of the cable(s). Similar to the power connection, keep to a minimum the amount of shielding removed from the cable(s) to install the connector pins and connector housing(s), making sure to observe the correct polarity and to leave the ground conductor free.
5. Crimp the connector pins to the exposed conductors using the tool. Slide the crimped wires into the connector housing, making sure to observe the correct polarity and to leave the ground conductor free.

Figure 10 – Wiring the analog outputs

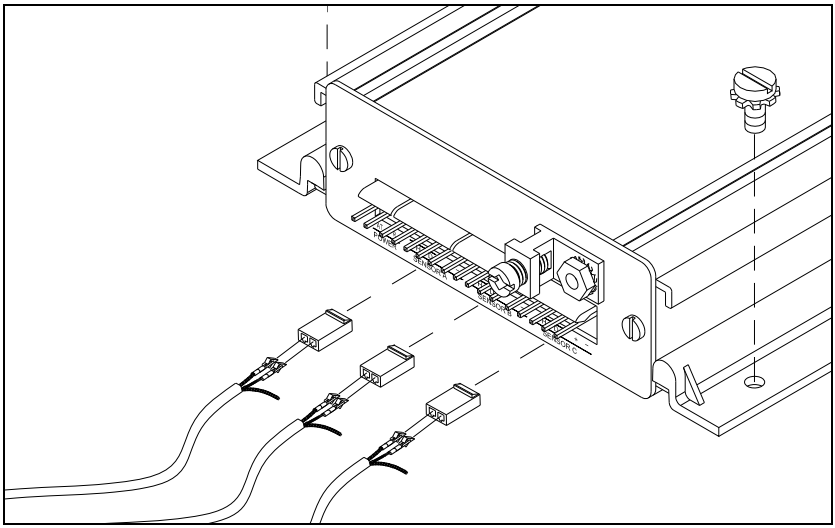
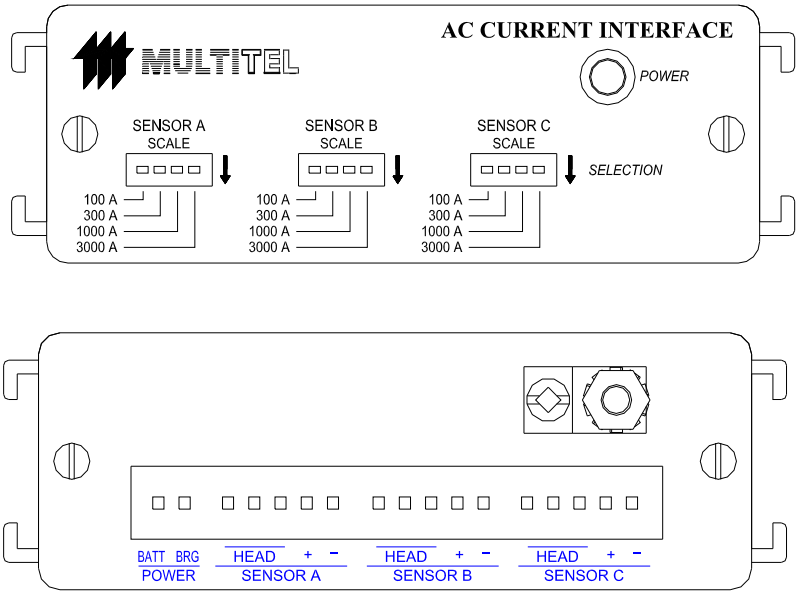


Figure 11 – AC Current Interface front and back panels



3.5 Final Steps in Installation

1. Install all AC Current Interface connectors to the control unit. This includes the flexible-core sensor connectors.
2. Install 'dummy' connectors on any pins that will not be wired. At this time no pin should remain exposed when installation is complete.
3. Consolidate all shield conductors together with a good ground conductor from the system. Fasten all the ground conductors under the ground screw located on the lug permanently attached to the back of the AC Current Interface control unit. At this point, no loose wires should remain.
4. Check the monitored states of the outputs to verify operation.

NOTE: The AC Current Interface is factory-calibrated. Should your AC Current Interface sensor need calibration, contact MULTITEL's customer services at support@multitel.com or 418-847-2255.

5. If not already permanently installed, install the control unit at its final location.

Figure 12 – Finished installation