



Input/Output Terminal Module

For the MoTeC Advanced Data Logger

Information and User's Guide

Introduction

General

The MoTeC Input/Output Terminal Module is an accessory product to the Advanced Data Logger (ADL). It offers greater connection flexibility to your data logging application, as well as incorporating a Power Supply, an additional RS232 Communication Port and a Realtime Clock.

The I/O Terminal Module and ADL can be used together as stand alone devices or mounted inside industrial or portable enclosures for further protection.

The I/O Terminal Module is connected to the ADL by a 1 metre 37 way cable. All connections are then made via plug-in screw terminal blocks.

Additional Features for the ADL

The I/O Terminal Module provides 3 additional features to the ADL:

- ◆ Realtime Clock – The RTC provides time and date channels to the ADL. The RTC facilitates time & date stamp logging, alarm events on time etc.
- ◆ RS232 Data – An additional full duplex RS232 port for both data in and PC communications
- ◆ Power Supply – An additional 1 Amp Power Supply to facilitate powering the ADL from either +12 VDC or +24 VDC Nominal power source (15 to 30 VDC)

ADL Channel Support

The I/O Terminal Module supports the "Base Unit" I/O configuration of the ADL (10 Analog, 8 Digital & 4 Aux. Outputs). All pins used in the ADL Base Unit configuration have been brought out to one or more individual screw terminals. Frequently used terminals (5V, 8V, 12V & 0V) have multiple connection points.

Terminals are grouped into blocks:

Analog Voltage:	6
Analog Voltage (Temperature/Terminated):	4
Switch Inputs:	4
Digital Inputs:	2
Speed Inputs:	2
Digital Auxiliary Outputs:	4
Power Input:	+12 VDC (Nom) +24 VDC (Nom)
Communication:	CAN Bus RS232 Modem RS232 Data

Prerequisites

This guide will assist you in installing and using the I/O Terminal Module with the ADL, and assumes a basic knowledge of the ADL and its software. If you are not yet familiar with using your ADL and Dash Manager Software then we recommend reading the ADL User's Manual and online help.

Checklist

The I/O Terminal Module Kit contains the following:

- ◆ I/O Terminal Module
- ◆ Interconnecting Cable Loom – To connect the I/O Terminal Module to the ADL
- ◆ Information and User's Guide – This document



KEY FEATURES AND BENEFITS

- ◆ Plug-in screw terminals for sensor, power and communications
- ◆ Supports ADL Base Unit I/O configuration
- ◆ Power Supply connections for 7 to 30 VDC range
- ◆ Realtime Clock
- ◆ Additional RS232 Port for data in and PC communications
- ◆ CAN Communication socket for communications (PC to ADL)

Getting Started

Important:

Read these instructions completely before proceeding with the installation of the ADL and I/O Terminal Module.

There are 3 steps to follow when installing and using the I/O Terminal Module for the ADL:

- ◆ Physically mount the I/O Terminal Module and the ADL
- ◆ Install the loom between the I/O Terminal Module and the ADL
- ◆ Connect power, communications and sensors to the I/O Terminal Module

STEP 1

Mount the I/O Terminal Module and ADL

- Select a suitable location (protected from moisture, dust and excessive heat or cold) in reasonable proximity to your sensor(s) and the ADL
- For fixed permanent installations use the key-holed mounting points at either end of the I/O Terminal Module (see Figure 3)
- Mount the ADL within proximity (<1 metre) of the I/O Terminal Module (refer to the ADL User's Manual for further mounting information)

STEP 2

Install the loom between the I/O Terminal Module and the ADL

- Connect the 37 pin D connector of the Interconnecting cable loom to the I/O Terminal Module and secure screws firmly (see Figure 3)
- Connect the 79 pin Auto Sport connector to the ADL and lock in place (refer to ADL User's Manual for further detail)
- Route and secure the Interconnecting cable loom away from any risk of damage, electrical noise and excessive heat

Getting Started (Cont.)

STEP 3

Connect Power, Communications and Sensors to the I/O Terminal Module

Tip: When making the connections, you may find it easier to unplug the screw terminal blocks from the I/O Terminal Module, insert and screw down the wires, then plug the blocks back in (blocks are keyed so that they can only be plugged back in their correct positions).

a) Connecting Power

For supply voltages of 12 VDC Nominal:

Connect supply positive to the +12V Nom terminal and the negative to the GND terminal. (see Figure 1)

The +12V Nom terminal will withstand voltages between 7 and 22 VDC. (refer to ADL User's Manual for detailed tolerances of the ADL power supply)

OR

For supply voltages above 22 VDC:

Connect your supply positive to the 30V terminal and the negative to the GND terminal. (see Figure 1)

This terminal will withstand voltages between 15 and 30 VDC (+24V Nominal).

Caution: Ensure polarity is correct.

b) Power Up

Switch on Power and confirm correct power up of the ADL.

The red power status LED on the I/O Terminal Module should now indicate power is available.

c) Connecting Sensors

There are various sensor types that can be connected to the I/O Terminal Module (see Figure 2 for a typical analog sensor connection example):

Analog Voltage: 1 to 6
 Analog Voltage (Temperature/Terminated): 1 to 4
 Switch Inputs: 1 to 4
 Digital Inputs: 1 to 2
 Speed Inputs: 1 & 3
 Digital Outputs: 1 to 4

(refer to the ADL Dash Logger User's Manual for details of usage for each of these sensor types)

d) Connecting PC Communications

Connect the CAN Communication cable from the PC to the I/O Terminal Module (see Figure 3).

Note: a termination resistor must be fitted to the CAN Bus terminal block (see Figure 4)

e) Software

Start Dash Manager Software and confirm the presence of communications with the ADL. (refer to the ADL User's Manual for details)

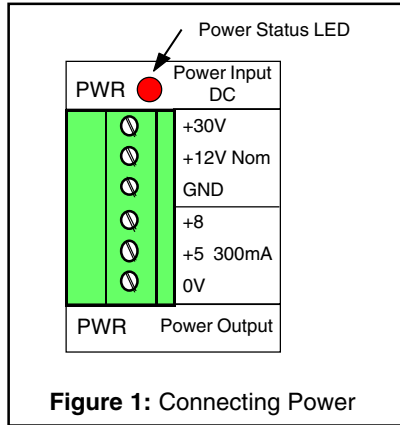


Figure 1: Connecting Power

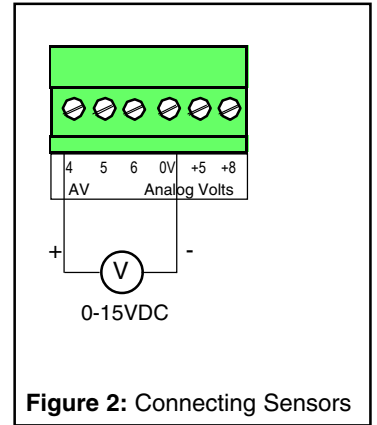


Figure 2: Connecting Sensors

Realtime Clock (RTC)

Introduction

The ADL has very accurately internal timers to facilitate logging/displaying of elapsed time, however it relies upon external devices to feed it information regards actual time and date. One source of time/date information for the ADL is via a Global Positioning System (GPS). A GPS can feed clock information (among other positional data) to the ADL via the RS232 communication port (the use of GPS systems with the ADL is not within the scope of this document).

The other source of time/date information is from dedicated clock devices connected to the RS232 or CAN bus interface of the ADL. The MoTeC I/O Terminal Module is fitted with a dedicated Realtime Clock (RTC) processor for this purpose. The RTC enables the ADL to log and display the actual time and date.

In addition, the RTC processor has a built in RS232, full duplex communications port. This RS232 Data port can be used for either accepting data from serial devices (Engine Management Systems, GPS systems, intelligent sensors etc.), or for additional telemetry communications with the ADL.

Internally the RTC sends data to the ADL via the high speed CAN bus, the physical connection to the CAN bus is already pre-wired upon delivery of your I/O Module.

Operation

After connection of the I/O Terminal Module to the ADL is completed (as discussed in the "Getting Started" section), you will then need to configure the RTC from within the software.

This includes:

- ◆ Setting the correct time/date for your time zone
- ◆ Setting the RS232 Data communications parameters
- ◆ Configure the appropriate channels for displaying/logging

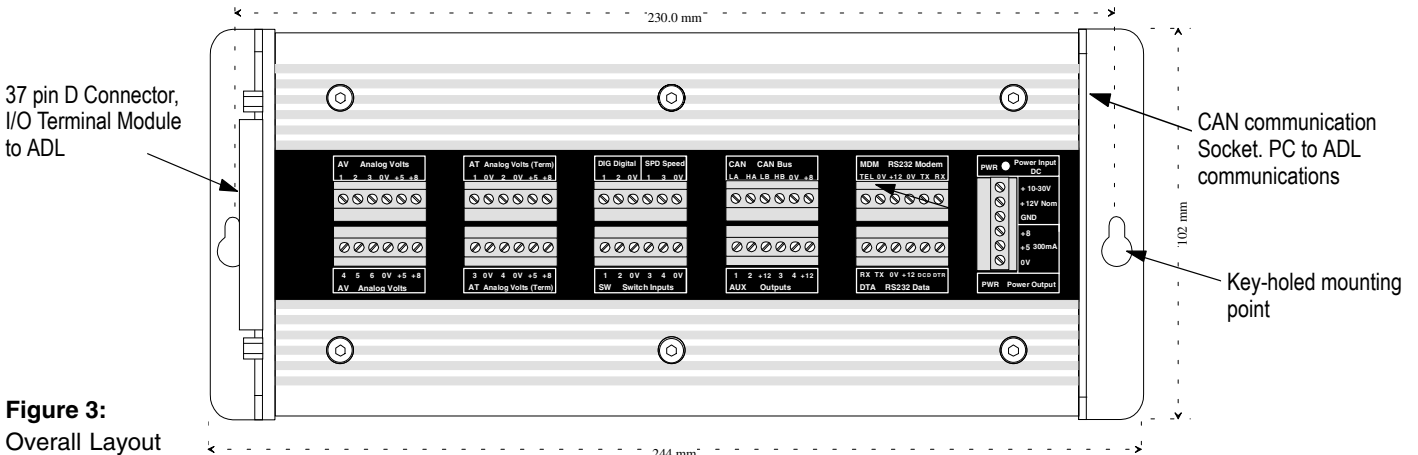


Figure 3: Overall Layout

Realtime Clock (Cont.)

STEP 1

Set the clock to your time zone

Supplied with your I/O Terminal Module is the RTC Setup software (file name "rtcset.exe"). This software allows you to synchronize the MoTeC RTC with your computers clock and to enable the additional RS232 communications port.

Note: Check and adjust if necessary, your computers time/date before proceeding.

- Insert the RT Clock disk in your PC. Copy the "RT Clock" folder and all of its contents to the C:\motec\ directory of your PC.
- Connect the CAN communications cable between your PC and the I/O Terminal Module.
- Confirm that the termination resistor (100 Ohm) is fitted between terminals LA and HA of the CAN Bus terminal block (see Figure 4).
- Run "rtcset.exe", located in the RT Clock folder. The Set Realtime Clock screen should now be visible (see Figure 5).
Note: if the CAN communications cable is not properly connected, or the termination resistor is not connected, the RTC Setup software will not proceed.
- The RTC Setup allows you to synchronize the MoTeC RTC to that of your computer. Press the SET button to synchronize the RTC clock to that of your computer. Also enable the Temperature Compensation.
- Enable and adjust the RS232 Data parameters as required. (see Figure 5)

STEP 2

Configure "Dash Manager" Software

The MoTeC Dash Manager software is used to configure the various clock channels for use within the software.

Clock Channels available include:

- ◆ Hundredths of seconds
 - ◆ Seconds
 - ◆ Minutes
 - ◆ Hours
 - ◆ Day of month
 - ◆ Month
 - ◆ Year
 - ◆ Day of week
- Go to the <Inputs><Communcations...> menu
 - Select the CAN 1 tab
 - Press the Template Select button
 - Choose the RTC Date and Time template
 - In the "Recieved Channels" window you will now have available the date and time channels. Check the channels you wish to use
 - These channels will now be available for logging, alarming and displaying throughout Dash Manager software

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MoTeC Products are distributed by:

I/O Terminal Module - Specifications

Power Supply (+12 V Terminal):	7 to 22 VDC, 12 VDC Nominal Reverse polarity protection
Power Supply (+30V Terminal):	15 to 30 VDC, 24 VDC Nominal Maximum 1000 mA Reverse polarity protection
Sensor Supply Currents:	200 mA Max
Current Drain (ADL & I/O Terminal Module):	300 mA, excluding sensor currents
Realtime Clock:	Resolution: 0.01 second Accuracy: 1 second per day Battery life: 10 years
Communications (RS232 Data):	Max. 9600 baud, Full Duplex RX, TX, 0V, +12V, Data Carrier Detect, Data Terminal Ready
Communications (CAN bus & RS232 Modem):	refer to ADL Dash Logger User's Manual for specifications
Interconnecting Cable Loom:	37 pin D connector to I/O Terminal Module, 79 pin Auto Sport connector to ADL, 1 metre cable length (other lengths are available on request)
Operating Temperature:	-10 to 70 Deg C
Dimensions:	L244mm x W102mm x H55mm Including terminals, excluding Interconnecting Cable Loom
Mounting:	Key-holed slots in endplates
Terminals:	Screw-type 6 way blocks, mounted in plug-in terminal blocks. Keyed to prevent incorrect insertion
Weight:	630 grams(without cable)

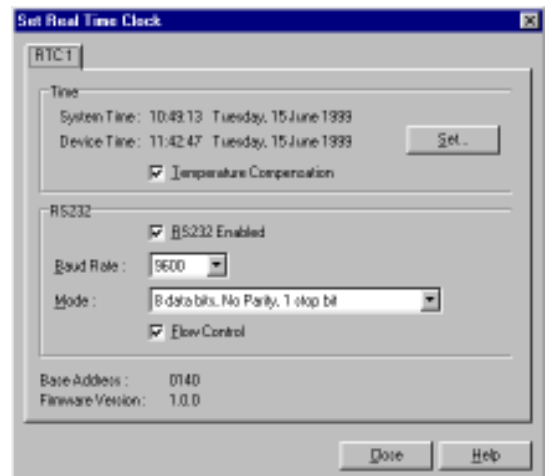
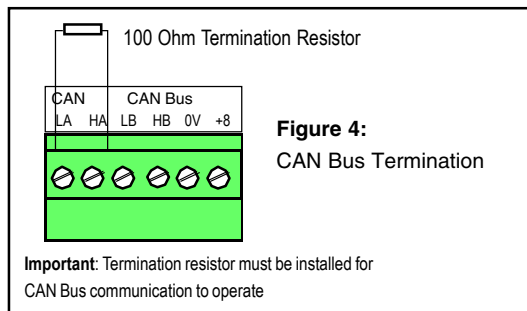


Figure 5:
Setup screen, RTC and RS232 communications