CHORE-TIME

®

I/O Expansion Box
Installation & Operator's Instruction Manual

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CTB Inc. warrants each new Chore-Tronics® product manufactured by it to be free from defects in material or workmanship for one year from and after the date of initial installation by or for the original purchaser. If such a defect is found by the Manufacturer to exist within the one-year period, the Manufacturer will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchaser the original purchase price, in lieu of such repair or replacement. Labor costs associated with the replacement or repair of the product are not covered by the Manufacturer.

Conditions and Limitations

1. The product must be installed by and operated in accordance with the instructions published by the **Manufacturer or Warranty will be void**.

2. Warranty is void if **all components** of the system are not original equipment supplied by the **Manufacturer**.

3. This product must be purchased from and installed by an authorized distributor or certified representative thereof or the Warranty will be void.

4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance shall not be considered defects under the Warranty.

5. This Warranty applies only to systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.

The **Manufacturer** shall not be liable for any **Consequential or Special Damage** which any purchaser may suffer or claim to suffer as a result of any defect in the product. **"Consequential"** or **"Special Damages"** *as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.*

THIS WARRANTY CONSTITUTES THE MANUFACTURER'S ENTIRE AND SOLE WARRANTY AND THIS MANUFACTURER EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSES SOLD AND DESCRIPTION OR QUALITY OF THE PRODUCT FURNISHED HEREUNDER.

Chore-Tronics® Distributors are not authorized to modify or extend the terms and conditions of this Warranty in any manner or to offer or grant any other warranties for Chore-Tronics® products in addition to those terms expressly stated above. An officer of CTB, Inc. must authorize any exceptions to this Warranty in writing. The Manufacturer reserves the right to change models and specifications at any time without notice or obligation to improve previous models.

Effective: **July 2004**

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Thank You

The employees of CTB Inc. would like to thank your for your recent Chore-Tronics® purchase. If a problem should arise, your Chore-Tronics® distributor can supply the necessary information to help you.

Contents

Support Information

The Chore-Tronics® I/O Expansion Box Control is used to add additional inputs and outputs to the Chore-Tronics® Model 16 and Model 24 Climate Control. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury. This manual is designed to provide comprehensive planning, installation, safety, operation, and parts listing information. The Table of Contents provides a convenient overview of the information in this manual. The Table of Contents also specifies which pages contain information for the sales personnel, installer, and consumer (end user).

Safety Information

Caution, Warning and Danger Decals have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety decals immediately.

Using the equipment for purposes other than specified in this manual may cause personal injury and/or damage to the equipment.

Follow Safety Instructions

Carefully read all safety messages in this manual and on your equipment safety signs. Follow recommended precautions and safe operating practices.

Keep safety signs in good condition. Replace missing or damaged safety signs.

Decal Descriptions

DANGER: Electrical Hazard

⚠ **DANGER**

ELECTROCUTION HAZARD!
Do not open this control box until electrical power is disconnected at circuit breakers.

2527-25

Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.
Ground all electrical equipment for safety.

All electrical wiring must be done by a qualified electrician in accordance with local and national electric codes.

Ground all non-current carrying metal parts to guard against electrical shock.

With the exception of motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.

The Chore-Tronics® I/O Expansion box can consist of an IARM-2 board, and IDM-16 board, or both. The IARM board provides a 0-10 Vdc output for controlling an external remote light dimmer. The IDM board provides digital inputs for up to 8-water meters, 7-feed scales and an airspeed meter.

Mounting the Control

The Chore-Tronics® I/O Expansion Box requires a minimum mounting area of approximately 18" x 18." **The Figure below** shows the I/O Expansion Box Mounted along with the Chore-Tronics® Model 16 giving extra space to allow for opening the boxes. The box should be mounted level on a solid backing using the mounting holes provided.
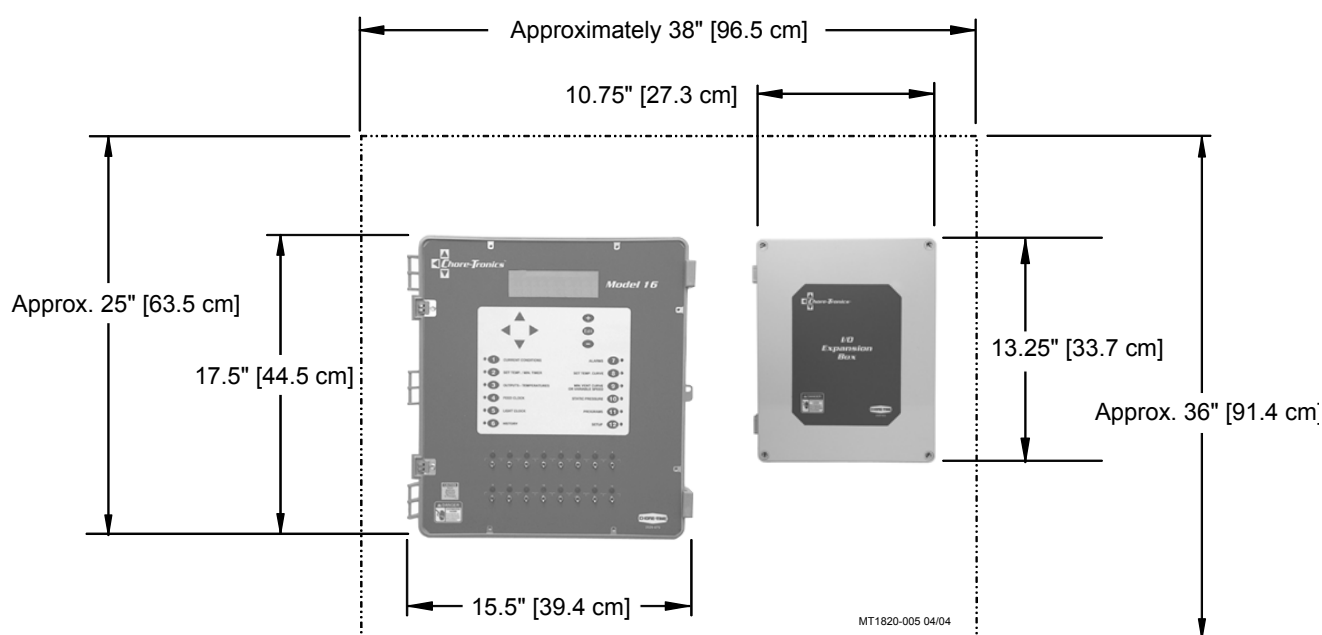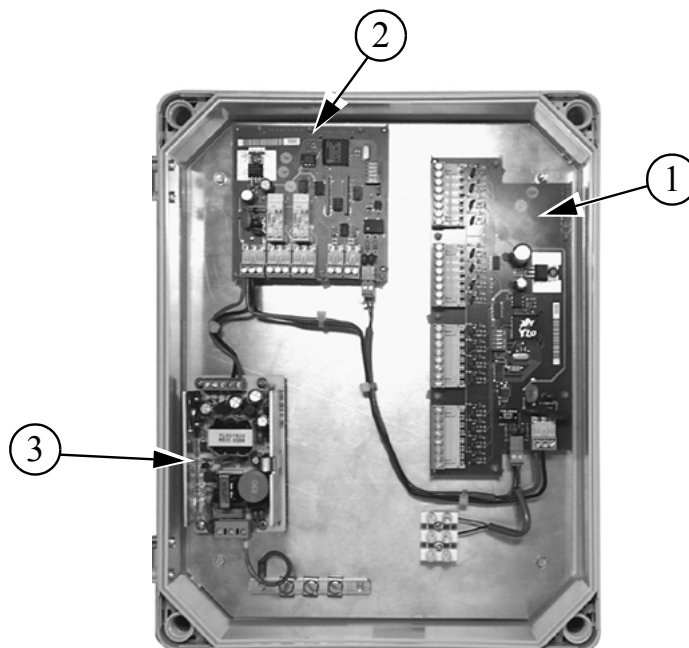

Figure 1. Mounting

No other electrical equipment (transformers, light dimmers, additional relays, etc.) should be mounted inside the expansion box.

The Chore-Tronics® I/O Expansion Box can consist of a maximum of three different types of boards. The boards are the IARM-2 board **(Item 2, Figure 2)**, the IDM-16 board **(Item 1)**, and the Power Supply **(Item 3)**.
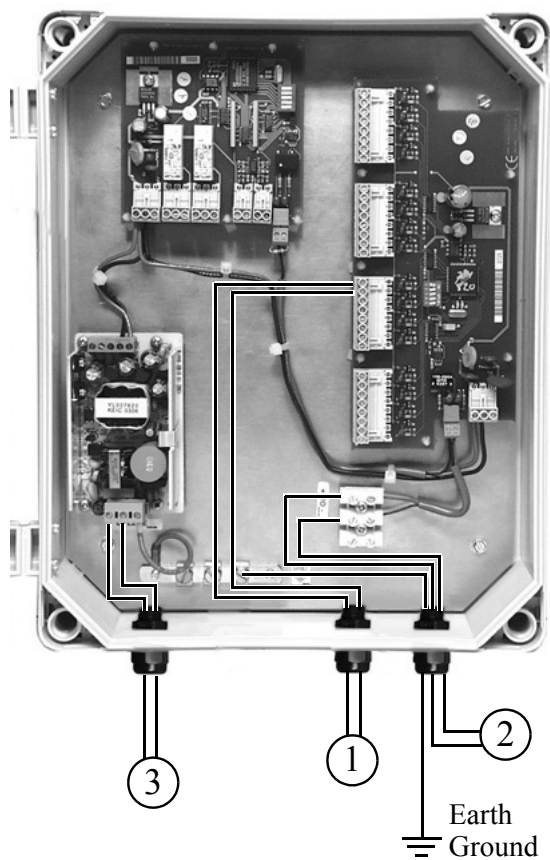

Item	Description
1	Digital Input (IDM-16) Board
2	Analog Output (IARM-2) Board
3	25W Power Supply

Figure 2. Wiring

Power Supply Wiring

When Wiring the I/O Expansion box, it is recommended that the line voltage wires be brought into one side of the bottom of the box and the low voltage wires (water meter inputs, feed scale inputs, light dimmer control output) be brought into the opposite side of the bottom of the box **(Figure 3 below)**. Bring the 220 volt power supply wires and connect them to the Power supply terminals labeled L1 and L2. The ground rail is only to be used to connect the Expansion box to Earth ground. It is recommended that a ground rod be located no more than 8-10' away from the Expansion box. The Expansion box should be connected to ground using a 12 gauge wire or larger. As always, check the local electric code for additional requirements.

Item	Description
1	Water Meter, Feed Scale, Light Dimmer Wires (Low Voltage)
2	I/O Net (Low Voltage)
3	Input/Output wires (High Voltage)

Figure 3. Power Supply Wiring

I/O Net Wiring

Connect the I/O net terminals in the Expansion box to I/O net terminals on the I/O board of the Chore-Tronics® Control using twisted pair sensor wire **(See Figure 4 below)**. Make sure that the positive **(+)** terminal of the Expansion box is connected to the positive **(+)** terminal of the control's I/O board. Check the dip switch number 2 located just above the I/O net terminals in the Chore-Tronics® Control's I/O board. Make sure that the switch is in the ON position. **(See Figure 4)**
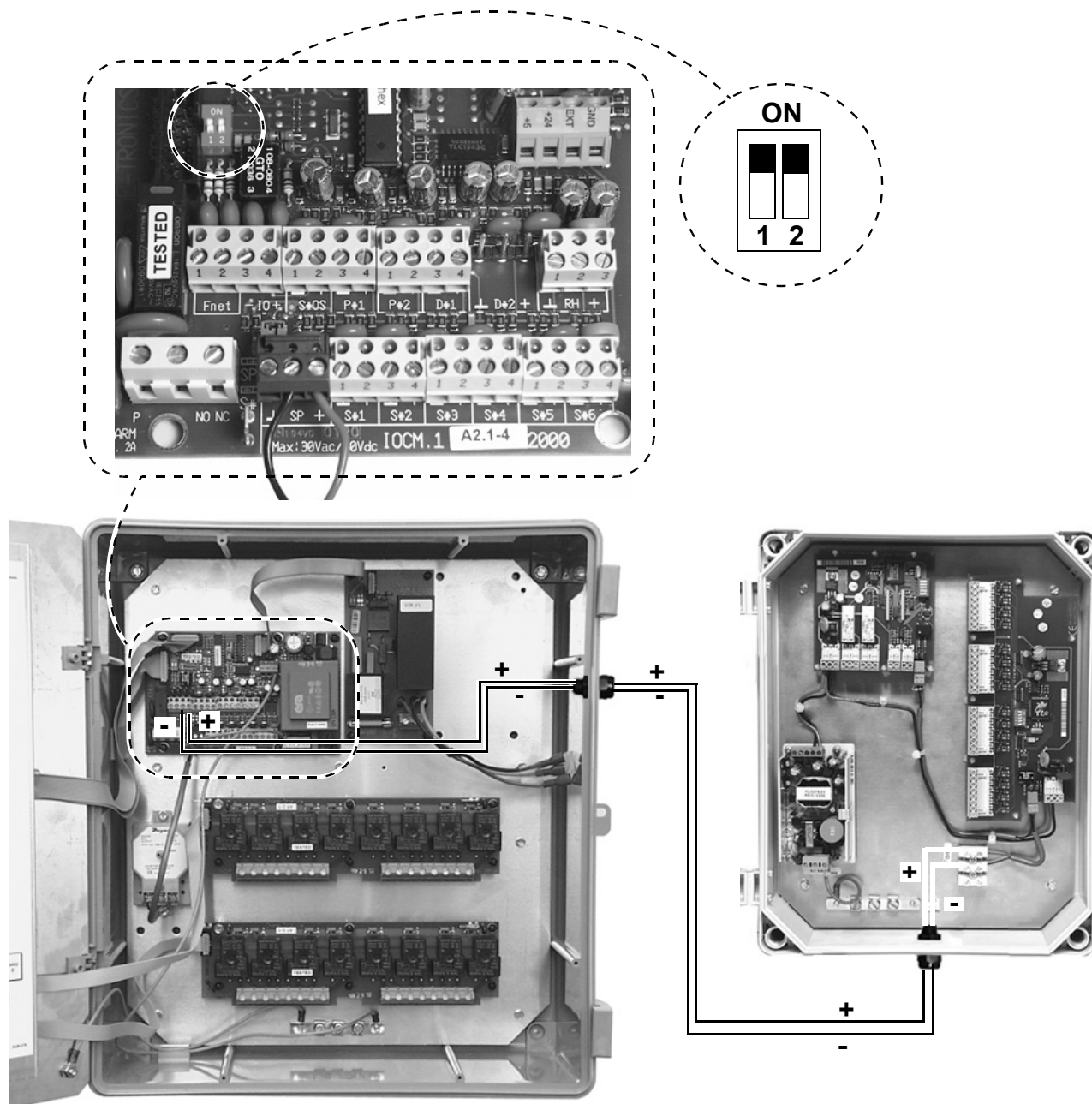

Figure 4. I/O Net Wiring

Pulsed Water Meter and Feed Scale Wiring

The pulsed water meters and feed scales require non-shielded 20 gauge twisted pair wire. This wire is available through Chore-Time (part number 42208). When routing this wire in the house be sure to keep the wire a minimum of 12" away from line voltage wiring. If there is a need for the sensor wire to cross line voltage wires, cross them at a 90 degree angle to each as shown below.
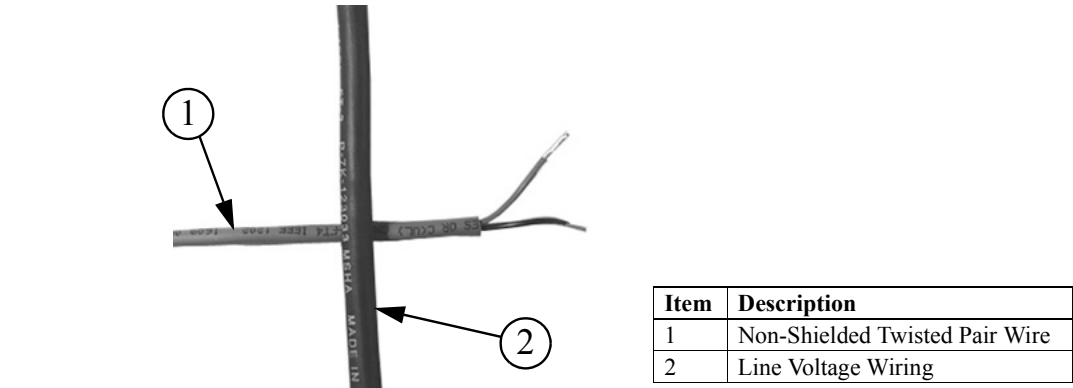

Item	Description
1	Non-Shielded Twisted Pair Wire
2	Line Voltage Wiring

Figure 5. 90° Cross-over

Connect Pulsed Water Meters #2 through #9 to the IDM board terminals as shown in **Figure 6 below** using the Twisted Pair Wire. If a water meter not sold by CTB, inc. is used make sure that has a dry contact output connection. DO NOT use a water meter that sends voltage out with every pulse. **Note** the correct position of the IDM Board Dip Switches.

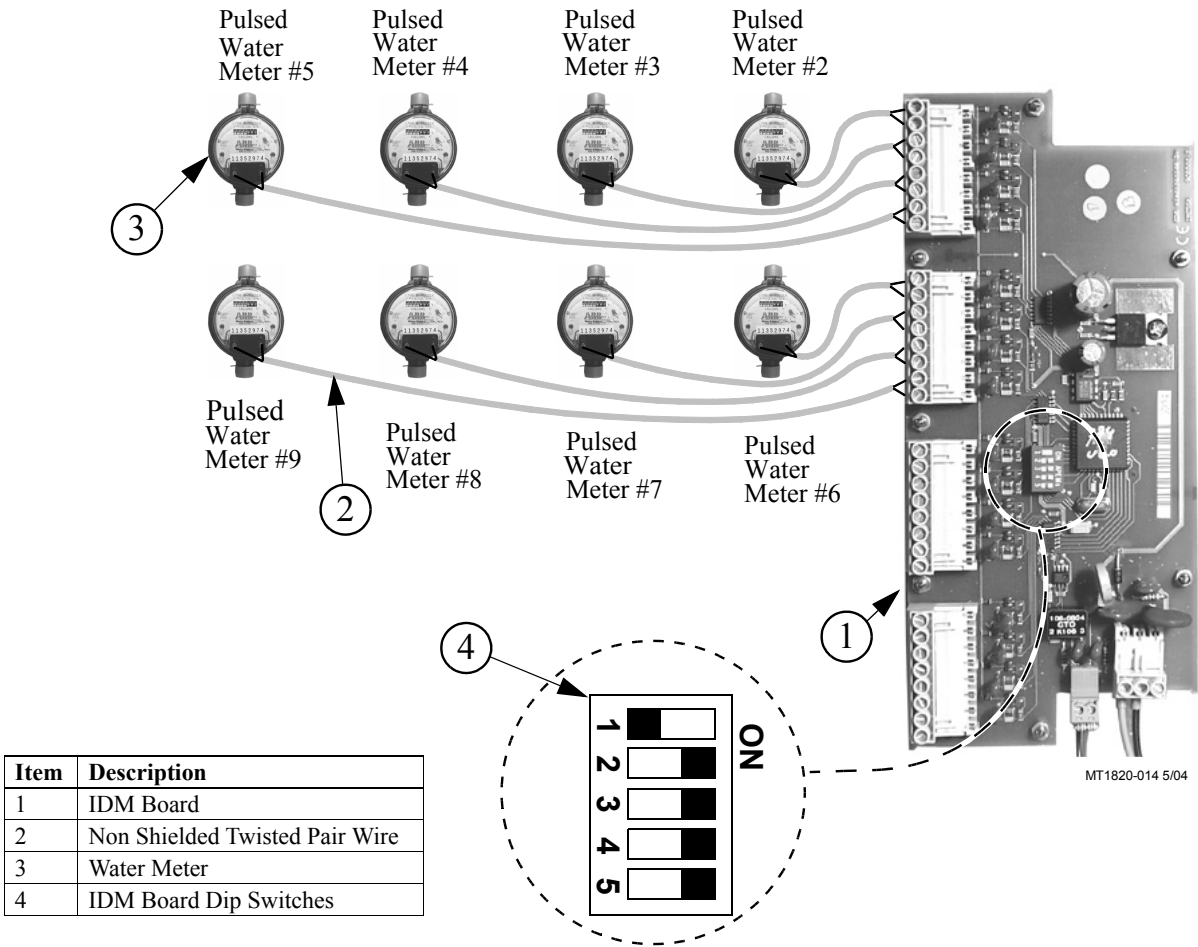| Item	Description
1	IDM Board
2	Non Shielded Twisted Pair Wire
3	Water Meter
4	IDM Board Dip Switches

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Figure 6. Water Meter Wiring

Using the blue and brown wires from the Feed Scales Connect Feed Scales #2 through #9 to the IDM board terminals using Twisted Pair Wire **(See Figure 7 below)**. **Note** the correct position of the Dip Switches. See Feed Scale Manual MT1811 for additional information if needed.
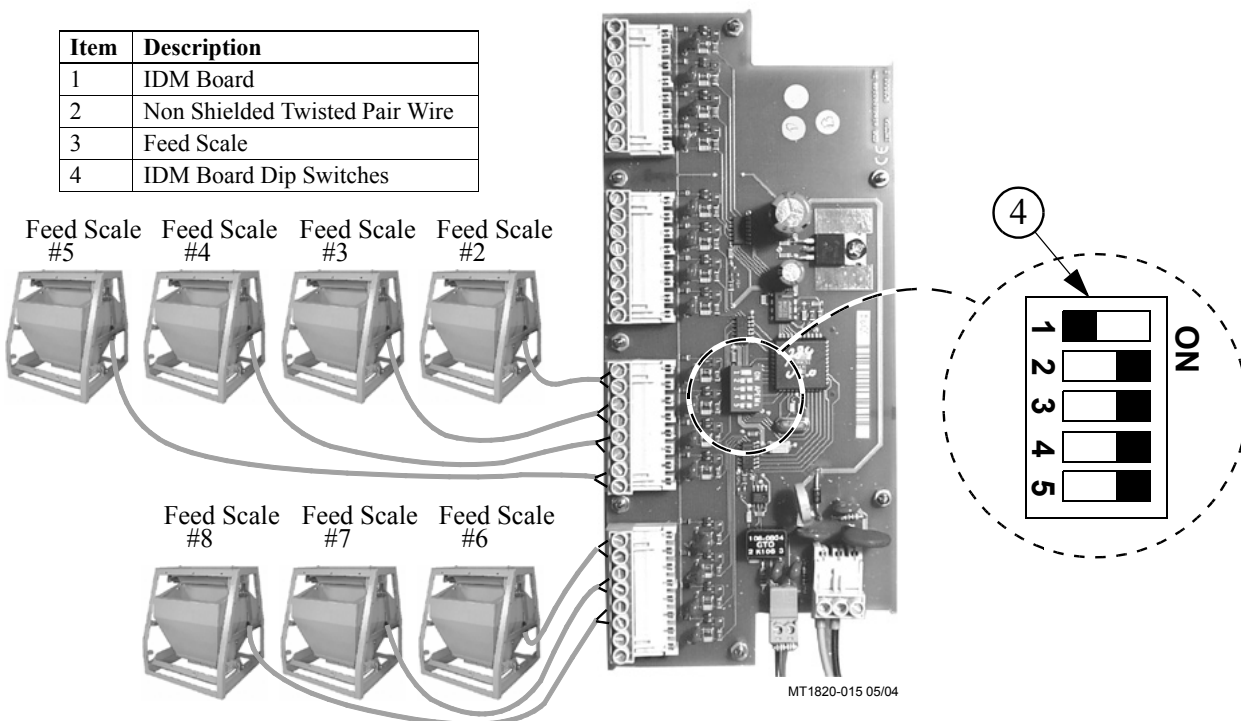
Item	Description
1	IDM Board
2	Non Shielded Twisted Pair Wire
3	Feed Scale
4	IDM Board Dip Switches

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Figure 7. Feed Scale Wiring

Airspeed Meter Wiring

The Airspeed Meter connects to the last digital input terminal on the IDM board using a three conductor wire with a shield **(See Figure 8 for Detailed Wiring)**. See Air Speed Meter manual for installing the Wind Speed Sensor inside the house.
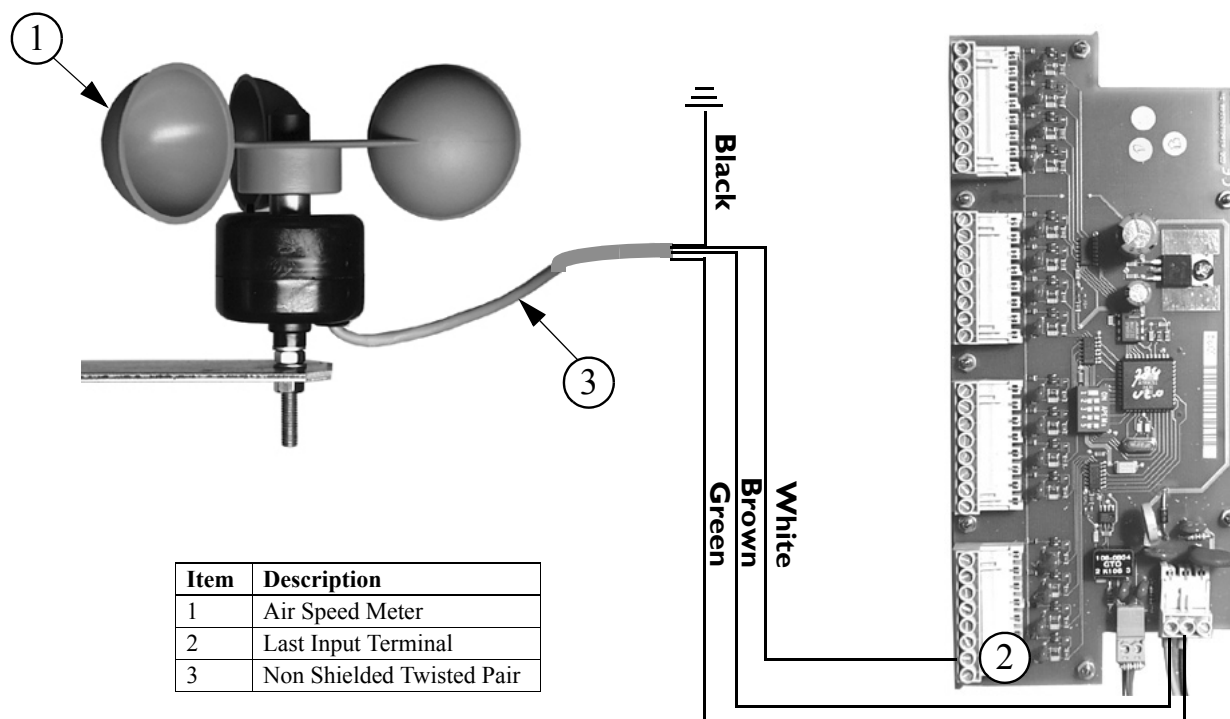

Item	Description
1	Air Speed Meter
2	Last Input Terminal
3	Non Shielded Twisted Pair

Figure 8. Airspeed Meter Wiring

Remote Light Dimmer Control Wiring

Before connecting the IARM board to a light dimmer, be sure to check that the light dimmer is equipped for remote control dimming. The light dimmer must be able to accept a 0-10 or 10-0 Vdc signal from the IARM board. Refer to the information provided by the light dimmer manufacturer for remote dimming wiring instructions.

The Light dimmer connects to the IARM board at the analog output #1 **(See Figure 9 below)**. Be sure that the positive terminal on the IARM board matches with the positive wire/terminal on the light dimmer.
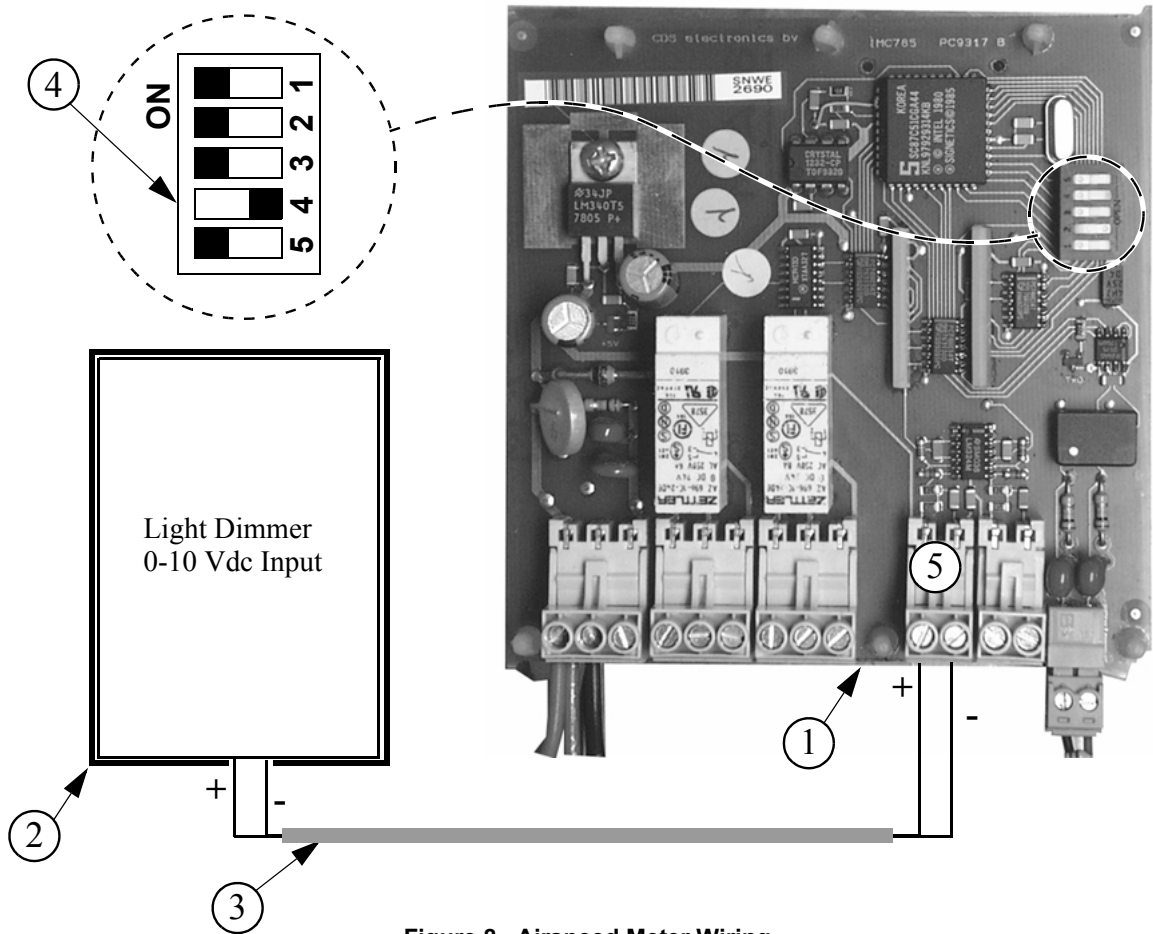

Figure 8. Airspeed Meter Wiring

Item	Description
1	IARM Board
2	Light Dimmer
3	Non Shielded Twisted Pair
4	Dip Switch
5	Analog Output #1

Make sure that the Chore-Tronics® Mdl 16/24 has a D1.0 level or greater EPROM chip installed. Once the Expansion Box has been properly installed, turn power on to the Chore-Tronics® control and the Expansion Box. Go to the Setup screen **(screen 12)** and scroll down to the following section.

```
OPTIONAL HARDWARE USED:
     Digital input board (IDM-16)        NO
     Analog output board (IARM-2)        NO
```

For each board that is installed in the expansion box change the "NO" selection to "YES." After confirming that the board should be activated, the control will try to communicate with the board(s). If an error message appears immediately, check the wiring connections at both boxes and then re-try to change the selection to "YES" **(Figure 7 below)**. Once the board has been activated please refer to the Model 16/24 manual or manual supplement for instructions on setting up the desired features.

```
OPTIONAL HARDWARE USED:
     Digital input board (IDM-16)        YES  ←——— Change to "Yes"
     Analog output board (IARM-2)         NO
```

Problem	Possible Cause	Possible Solution
"ATTENTION!!! Board not available" message appears when trying to activate IDM-16 or IARM-2	A.) I/O Net wires improperly connected. B.) No power to board(s) C.) Address DIP switches set incorrectly. D.) Defective board in expansion box E.) Defective I/O board in Chore-Tronics control	A.) Check for proper I/O Net wiring in both the expansion box and the Chore-Tronics control. I/O Net is polarity sensitive. B.) Check for 24 Vdc supply to board(s). C.) See IDM-16 and IARM-2 wiring diagrams (page 9 and 11) for proper DIP switch settings. Cycle power off then on after changing switch settings. D.) Replace defective board E.) Replace defective I/O board.
IARM IONET ERROR alarm appears in Alarms screen of Chore-Tronics control. Board does not function.	A.) No power to board. B.) I/O Net wires disconnected or connected incorrectly. C.) Address DIP switches set incorrectly on IARM-2 board. D.) Defective IARM-2 board.	A.) Check for 24 Vdc supply to IARM-2 board. B.) Check for proper I/O Net wiring in both the expansion box and the Chore-Tronics control. I/O Net is polarity sensitive. C.) See IARM-2 wiring diagrams page 11 for proper DIP switch settings. Cycle power off then on after changing switch settings. D.) Replace defective board

Troubleshooting Continued.....

|		
IDM-16 IONET ERROR alarm message appears in Alarms screen of the Chore-Tronics control. Board does not function.	A.) No power to board. B.) I/O Net wires disconnected or connected incorrectly. C.) Address DIP switches set incorrectly on IDM-16 board. D.) Defective IDM-16 board.	A.) Check for 24 Vdc supply to IDM-16 board. B.) Check for proper I/O Net wiring in both the expansion box and the Chore-Tronics control. I/O Net is polarity sensitive. C.) See IDM-16 wiring diagrams page 9 for proper DIP switch settings. Cycle power off then on after changing switch settings. D.) Replace defective board
IARM-2 board will not dim lights on remote light dimmer. 5 Vdc is present at Analog Output 1 when light percentage is set to 50% on the Light Clock of the Chore-Tronics control.	A.) Improper connection between IARM-2 board and remote light dimmer. B.) See remote light dimmer manual for additional information	A.) Check connections between IARM-2 board and remote light dimmer. Connection is usually polarity sensitive.
IARM-2 board will not dim lights on remote light dimmer. 5 Vdc is NOT present at Analog Output 1 when light percentage is set to 50% on the Light Clock of the Chore-Tronics control.	A.) See "IARM IONET ERROR" section of trouble shooting guide.	

Troubleshooting Continued.....

Airspeed sensor readout on Chore-Tronics control constantly reads "LOW" even while in full tunnel mode.	A.) Airspeed less than 125 feet per minute. B.) Airspeed sensor not properly connected to the IDM-16 board. C.) Defective airspeed sensor. D.) Defective IDM-16 board.	A.) Airspeed readout will show "LOW" until airspeed reaches 125 feet per minute or greater. A.) Check wiring connections for the airspeed sensor at the IDM-16 board. See page xx for wiring diagram. B.) Replace defective airspeed sensor. D.) Replace defective board.
1 or more of water meter(s) and/or feed scale(s) #2-#9 not recording usage in Chore-Tronics control.	A.) Function is not set on the water meter/feed scale in the setup screen. B.) Water meter/feed scale not properly connected to the IDM-16 board. C.) Defective water meter, or feed scale pulse switch. D.) Defective IDM-16 board.	A.) Be sure that every connected water meter is set either as a drinker or a non drinker meter in the setup screen of the Chore-Tronics control. Be sure that every connected feed scale is set either as a feed or non feeder. B.) Check for proper wiring connections on the IDM-16 board. See page xx for wiring diagram. C.) Replace defective meter or feed scale pulse switch. D.) Replace defective IDM-16 board.
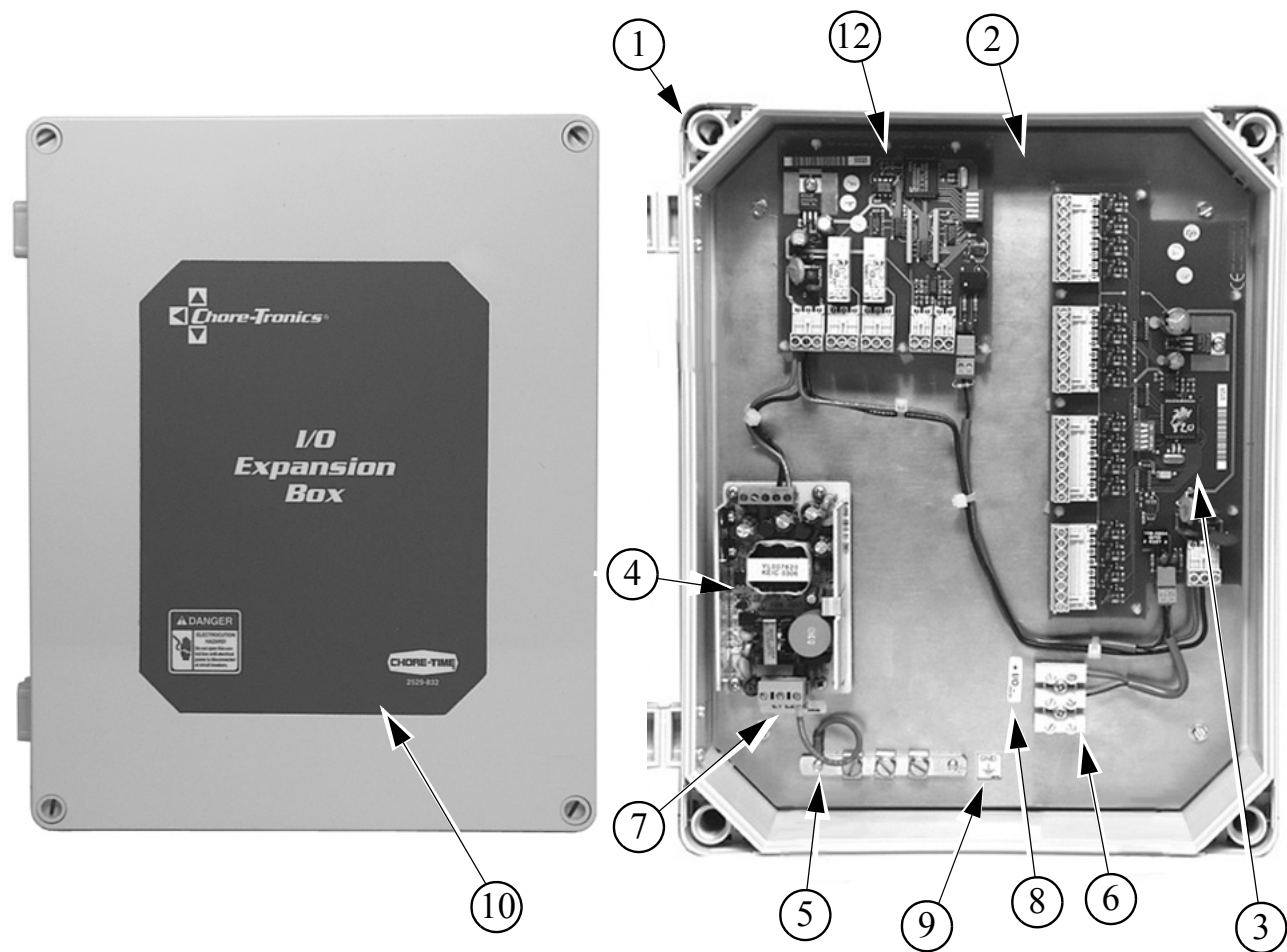
Item	Description	49330 IDM Expansion Box	49331 IARM Expansion Box	49332 IDM-IARM Expansion Box
		Part No.		
1	Sarel Box (13 x 10.2 x 3.6)	49328	49328	49328
2	I/O Expansion Plate	49329	49329	49329
3	Digital Input (IDM) Board	48536	not applicable	48536
4	Power Supply 25W	48861	48861	48861
5	Grounding Rail	43384-2	43384-2	43384-2
6	3 Pole Terminal Strip	34925-3	34925-3	34925-3
7	Expansion Box Input Power Decal	2526-440	2526-440	2526-440
8	Expansion Box I/O Net Decal	2526-441	2526-441	2526-441
9	Ground Decal	2527-63	2527-63	2527-63
10	I/O Exp. Box Decal	2529-832	2529-832	2529-832
11	Twisted Pair Sensor Wire (Not Shown)	42208	42208	42208
12	Analog Output (IARM-2) Board	not applicable	48537	48537

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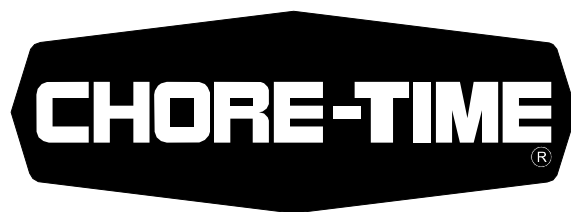
Revisions to this Manual

Page No.	Description of Change
	New Book

Contact your nearby Chore-Tronics® **distributor or representative for additional parts and information.**

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