



Drexelbrook
Engineering Company

RF Level and
Flow Controls

Installation and Operating Instructions

For

401-3700 Series Receivers (Logic Interface)

LCT™ Two-Wire Level Control Systems

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LCT™ Two-Wire Level Control Systems

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Table of Contents

- 1.0 Introduction
 - 1.1 System Description
 - 1.2 Models Available
- 2.0 Specifications
- 3.0 Installation
 - 3.1 Unpacking
 - 3.2 Mounting the Receiver Package
 - 3.3 Wiring the Logic Interface Receivers
 - 3.3.1 Power Wiring
 - 3.3.2 Logic Output Wiring
 - 3.3.3 Signal Loop Wiring
- 4.0 Operation
 - 4.1 Start-Up
 - 4.2 Power Supply
 - 4.3 Logic Output
- 5.0 Troubleshooting
 - 5.1 Testing the Logic Output Signals
 - 5.2 Testing the Power Supply
- 6.0 Factory Service Assistance
 - 6.1 Telephone Assistance
 - 6.2 Equipment Return
 - 6.3 Field Service
 - 6.4 Customer Training

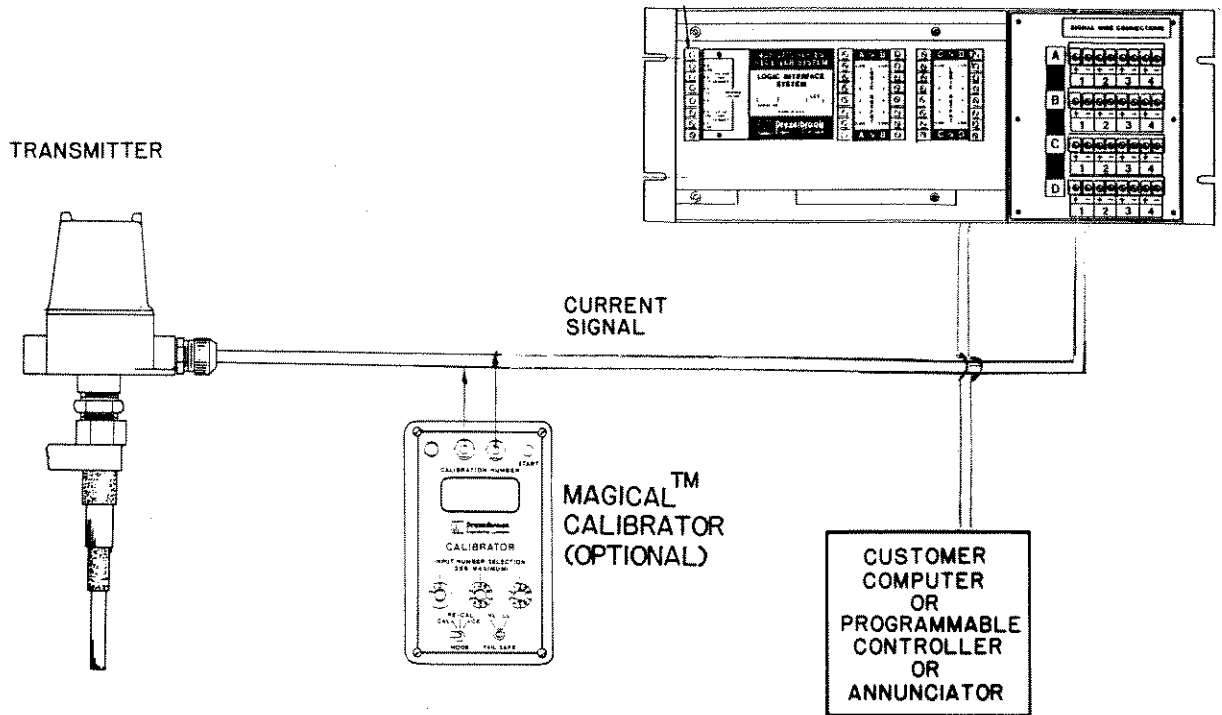


Fig. 1-1
Typical System

1.0 Introduction

The instructions in this manual are for the installation and operation of Drexelbrook Series 401-3700 Receivers, to be used with the LCT™ Series two-wire point level transmitters.

1.1 System Description

The LCT Series two-wire point level transmitters are precision, RF (radio frequency) operated level instruments. They provide a step change in current output when the material being measured reaches a preset point in the vessel. The transmitters output (4-10 mA in the alarm state and 15-25 mA in the normal state) can be used with any of the Drexelbrook 401-3700 Series receivers. See Figure 1-1.

1.2 Models Available

The following receivers can be used with either the LCT 506-6200 Series or the 506-6200 (91-30) Series MagiCal transmitters.

The 401-3700 Series Logic Interface receivers sense and convert switched signals, from the LCT Series two-wire point level control, into 0 or 5 Volt signals used by customer supplied

control devices. Drexelbrook provides one 24 volt power supply to power up to 16 loops. Figure 1-2.

The following receiver models are line fail-safe for opens or shorts.

401-3710-X12*: 120/230 Vac or 24 Vdc, 12 X 14 Nema 12 housing.

401-3710-X16*: 120/230 Vac or 24 Vdc, 19-inch EIA relay rack.

* X = Number of 4-point cards, 1 to 4.

Specifications

2.0 Specifications

- A. **Power Requirement -**
115/230 Vac 50/60 Hz and/or 22-26 Vdc,
18 watts.

Power input back up may be accomplished by providing both an A.C. supply and a D.C. supply. See Section 3.3.1.

- B. **Operating Temperature -**
32F to 140F recommended. Receiver will operate above 140F, but with reduced component life.

- C. **Logic Output (TTL Compatible)**
5 ± .5 Vdc in "normal" state
.25 ± .25 Vdc in "alarm" state

- D. **Internal Power Supply -**
24 Vdc supplies up to 16 loops.

3.0 Installation

3.1 Unpacking

Carefully remove the contents of the shipping carton and check each item against the packing list before destroying any packing materials. If there is any shortage or damage, report it immediately to the factory.

3.2 Mounting the Receiver Package

All Drexelbrook receiver packages are designed for mounting in the control room, particularly the rack mounted models and larger relay cabinets. However, the 12" x 14" package in a weatherproof housing and the 24" x 24" package in a Nema 4 housing may be field mounted. We recommend that they be mounted in a location as free as possible from vibration, corrosive atmospheres, and the possibility of mechanical damage.

For convenience at start-up, it is best to mount the receiver package in an easily accessible location. See Figures 3-1, 3-2, 3-3, 3-4.

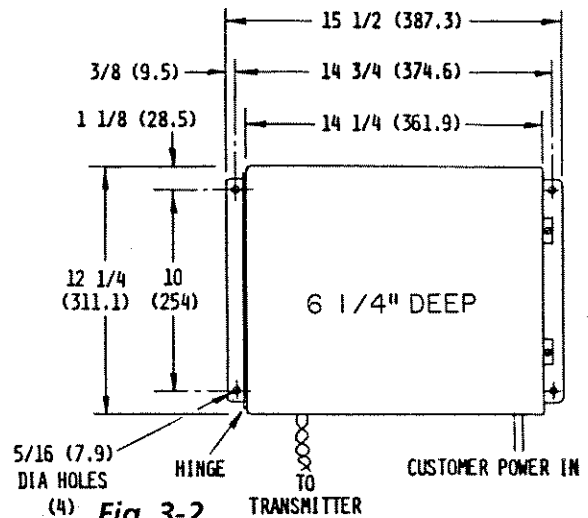


Fig. 3-2
Mounting Dimensions of
12" x 14" Weatherproof Housing

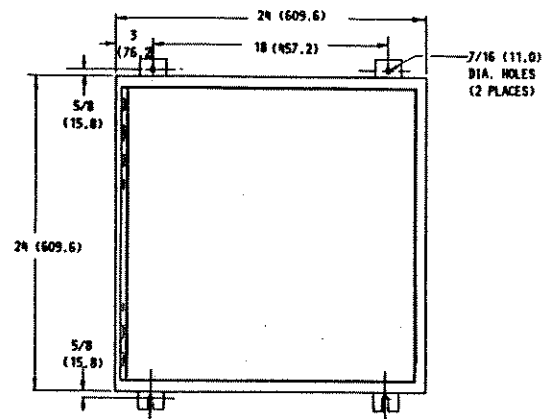


Fig. 3-3
Mounting Dimensions of
24" x 24" Nema 4 Housing

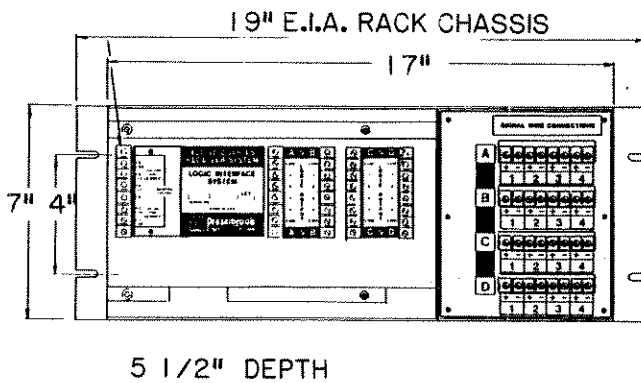


Fig. 3-1
Mounting Dimensions of
19-inch Rack Unit

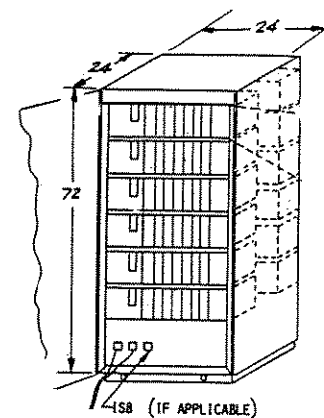


Fig. 3-4
Mounting Dimensions of
24" x 70" Rack Cabinet

Installation

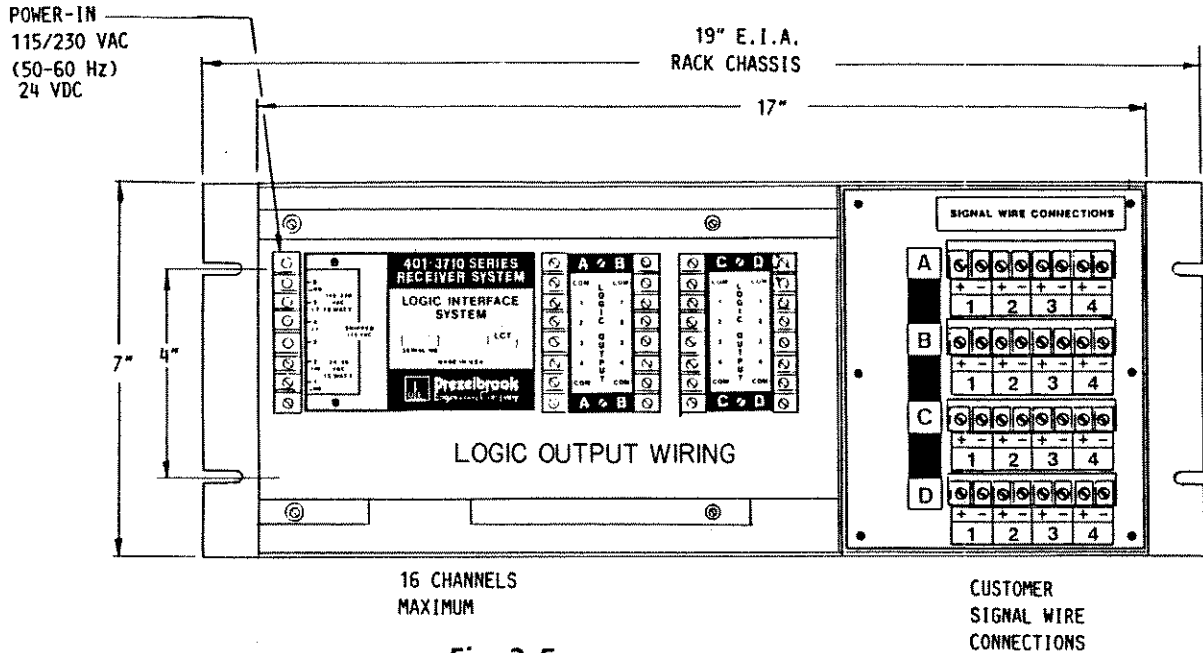


Fig. 3-5
Customer Wiring to
401-3700 Series Unit

3.3 Wiring the Logic Interface Receivers

Customer wiring connections to the logic interface receivers include 115/230 Vac or 24-50 Vdc power wiring, signal loop wiring, and logic output wiring.

3.3.1 Power Wiring

Power connections are made to the power input terminal strip, as shown in Figure 3-5. Connections for both "ac" and "dc" power are provided. By connecting both the 'ac' and 'dc' power source, the receiver will continue to operate with the loss of either power source. With a back-up 'dc' source of 24-50 Vdc, the 'ac' source will provide all the required power over the full specified 'ac' range, and the 'dc' source will contribute power only when the 'ac' source is below its specified range.

3.3.2 Signal Loop Wiring

The two-wire signal wiring from each of the field transmitters is connected to terminal strips (four strips with four loop connections each) in the receiver that are labeled for each of the loops. See Figure 3-5.

3.3.3 Logic Output Wiring

The logic output cards are connected to terminal strips labeled to correspond with the same numbers on the input signal terminal strips. One common connection is provided for every two logic output signals. Voltage output signals depend on the fail-safe state of the transmitter. See Figures 3-6 and 3-5.

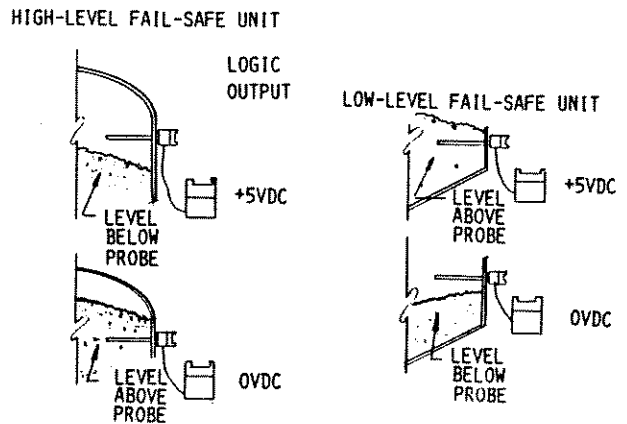


Fig. 3-6
Fail-Safe Output of
401-3700 Series Unit

4.0 Operation

4.1 Start-up

Before applying power to the instrument, check all wiring connections. See Section 3.3.

4.2 Power Supply

The Drexelbrook Logic Interface units contain a regulated 24 Vdc power supply that provides power for up to 16 signal loops and the processing of that signal information. The power supply's output is controlled regardless of changes in the input voltages.

4.3 Logic Output

Each of the standard logic interface units contains up to 4 logic cards (4 output signals per card) that provide either a 0 or 5 volt signal, depending on the transmitter's input. See Section 2.0.

Logic cards are field changeable and can be added after purchase to increase the number of active channels.

Troubleshooting

5.0 Troubleshooting

The LCT Series Receivers are designed to give years of unattended service. No periodic or scheduled maintenance is required.

If a difficulty does occur in the operation of your receiver, the troubleshooting procedures listed here should be followed. If attempts to locate the difficulty fail, notify your local factory representative or call the factory direct and ask for the service department.

5.1 Testing the Power Supply

- To verify proper power supply operation, measure the voltage across any pair of signal loop terminals at the receiver that do not have field wiring. See Figure 5-1. Voltage must equal 24 ± 0.3 Vdc.
- With the voltmeter still connected, measure the voltage across another pair of signal loop terminals. Voltage should remain the same.

5.2 Testing the Output Signal

- Disconnect a pair of signal wires at the receiver. See Figure 5-1.
- One at a time, hook up resistors of 2000Ω , 1200Ω , and 330Ω to the signal connections. Measure the voltage of each corresponding logic output with respect to ground.
- Compare your results with those in the chart in Figure 5-2. A discrepancy indicates a faulty channel.

Resistors (ohms) at Signal Wire Terminals	Voltage at Corresponding Logic Output Terminals
2000 Ω	.25 \pm .25 VDC
1200 Ω	5 \pm .5 VDC
300 Ω	.25 \pm .25 VDC

Fig. 5-2
Output Signal Chart

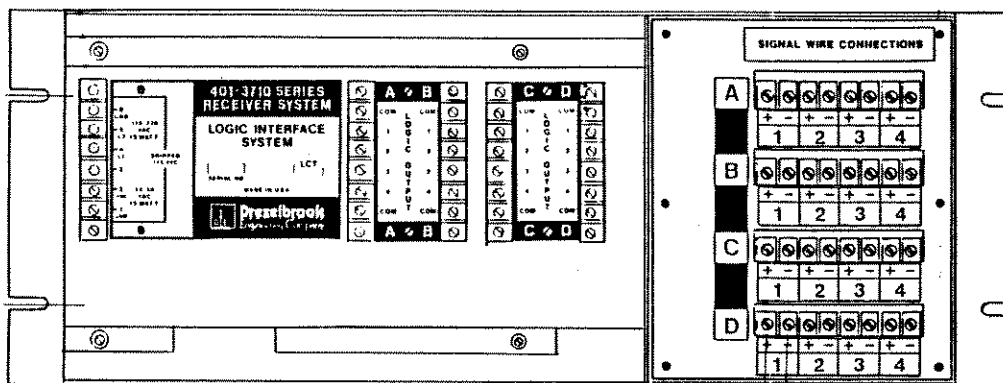


Fig. 5-1
Testing the 401-3700 Series Unit

6.0 Factory and Field Service Assistance

6.1 Telephone Assistance

If you are having difficulty with your Drexelbrook equipment, and attempts to solve the problem have failed, notify your local Drexelbrook representative, or call the factory direct and ask for the Service Department. Drexelbrook Engineering Company is located at 205 Keith Valley Road, Horsham, PA 19044. The telephone number is (215) 674-1234. To help us solve your problem quickly, please have as much of the following information as possible when you call:

Instrument Model # _____

 Probe Model # _____

 P.O. # _____
 & Date _____
 Cable Length _____
 Application _____

 Material Being Measured _____

 Temperature _____
 Pressure _____
 Agitation _____
 Brief Description of the Problem _____

 Checkout Procedures that Failed _____

6.2 Equipment Return

Do not return equipment **without** first contacting the factory for a return authorization number. **Any** equipment being returned must include the following information in addition to that above.

Reason for Return _____

 Return Authorization # _____
 Person to Contact at Your Company _____

 "Ship-To" Address _____

If available, please include the original P.O. # an the original Drexelbrook order # also.

To keep the paperwork in order, you must include a purchase order with returned equipment, even though it may be coming back for warranty repair. You will not be charged if the equipment is covered under warranty. Please return your equipment with freight charges prepaid. We regret that we cannot accept collect shipments.

Standard electronic units are generally in factory stock. If the application is critical, a spare electronic chassis should be kept on hand.

6.3 Field Service

Trained field servicemen are available on a time-plus-expense basis to assist in start-ups, diagnosing difficult application problems, or in-plant training of personnel. Contact the Service Department for further details.

6.4 Customer Training

Periodically, Drexelbrook instrument training seminars for customers are held at the factory. These sessions are guided by Drexelbrook engineers and specialists, and provide detailed information on all aspects of level measurement, including theory and practice of instrument operation. For more information about these valuable workshops, write to Drexelbrook Engineering, Attn: Communications/ Training Group, or call direct (215) 674-1234.



205 Keith Valley Road, Horsham, PA 19044
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