

VERTEX INTERNATIONAL, INC.



LACQUER TRACKER LT-05 INSTALLATION AND USE MANUAL

VERSION 2.01 (5-12-2009)



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The LT-05 Lacquer Tracker is an electronic instrument - part of a two-part flow metering/alarm system. It is used with a positive-displacement flowmeter head chosen for the application. For food and beverage can lacquer spraying applications, Vertex supplies the companion FM-05 Flow Meter.

Supplied in a 1/4-DIN size free-standing cabinet, it can also be removed from the cabinet and installed as a 1/8-DIN size panel meter with suitable external wiring. It is very flexible in application, and can be re-programmed manually from the front panel or automatically from a laptop computer if desired.

2. Installation requires the following steps:

Choose a location for the unit, then mount it securely. Use the two side panel braces to mount to a vertical panel with a 1/4 DIN (96mm square) opening. Use the supplied Allen wrench to remove the set screws and braces, install the unit in the panel, then replace the braces and tighten them behind the panel to support the unit.

Connect the two-wire flowmeter head to the rear terminals (see section 7 below for wiring connections). The Vertex FM-05 flowmeter is not polarized - connect the yellow and green wires either way round - we suggest green to ground. **WARNING** - fill the liquid system slowly; the flowmeter will be damaged by the use of an air purge or filling too fast.

Connect a low flow warning system to the (SP1, relay 1) 'normally open' or 'normally closed' relay contacts, as desired. Connect the high flow alarm warning to SP2, relay 2 as desired. **SAFETY NOTICE** - if using high voltages on the relay contacts, provide operator access protection and warning labels as required.

Provide a 110 - 220VAC (the unit is self-adjusting) power source, using the IEC power connector supplied.

3. Use

In use, the meter shows the flow rate in cubic centimeters (milliliters) per minute (cc/min or ml/min). The symbol at the left of the display is an 'r' signifying Rate. The low flow alarm setting is set at a selectable percentage below the normal flow rate.

To automatically program the low flow alarm setting, the operator sets up the desired flow rate of liquid through the system, then presses the front panel button. When the green light flashes three times, the low flow alarm level has been set appropriately.

For example, if the unit is adjusted to alarm at a flow level 10% less than normal, pressing the button when the meter is showing a 'normal' rate of 62 cc/min will set the alarm level to 62 - (10%), which is 62 - 6, which is an alarm level of 56. When the flow rate drops to less than 56 for more than ten seconds, the SP1 relay will close. To change the percentage, rotate the ten-position switch visible through the opening in the top of the red polycarbonate meter case. Percentages from 5% to 50% are available in positions 0 - 9: **0** = 5% **1** = 10% **2** = 15%
3 = 20% **4** = 25% **5** = 30% **6** = 35% **7** = 40% **8** = 45% **9** = 50%

Troubleshooting hint: if the green light does not flash three times shortly after the button is pressed, check that the slide switch on the rear of the unit is in the front (NORMAL) position, and that the meter's serial parameters have not been changed (see 'Manual Programming' below).

4. Manual Programming.

Manual programming can be done while the meter is in use, using the five front panel buttons DSP, PAR, F1(up), F2(down), RST.

First, choose which group of parameters you wish to examine or change (see the list below). Press the PAR button once - you should see the display change to PRO, then alternately show NO (meaning 'Programming/Number").

Since the display is in the 'seven-segment' format, it will look more like pro and no.

Now press the F1 button once and watch the display change to 1-INP (if you wait too long to press F1, the display will return to normal, and you will have to press PAR again). Pressing F1 more than once will cycle through nine groups of parameters, as follows:

1-inp	Counter Input parameters
2-fnc	User Input & Function key parameters
3-loc	Display and Program lockout parameters
4-rte	Rate Input parameters
5-ctrc	Counter C Input parameters (not applicable to this meter)
6-spt	Setpoint (Alarm) parameters
7-srl	Serial Communications parameters
8-ana	Analog output parameters (not applicable to this meter)
9-fcs	Factory Service parameters

Refer to the help system installed by the program for full details of the many parameter changes available. We do not recommend making changes to most of the parameters, but as an example we illustrate how to set a maximum flow rate alarm.

5. Example: To set a maximum (high) flow rate alarm set point:

Starting from a normal display (with the rate displaying either zero or a rate number), press PAR once, then press F1 six times to move to the 6-SPT display. Press PAR again once to show the SPSEL, alternating with NO display (an abbreviation for 'Set Point Select/Number'). Press F1 twice

to move from the SP1 relay setting (already in use as the low flow rate alarm) to the SP2 setting. Press PAR again, the display shows LIT-2, alternating with NOR (for Light 2/Normal). Press F1 twice to make this show LIT-2/ FLASH.

Press PAR again to show OUT-2/NOR, then again to show SUP-2/OFF, then again to show ACT-2/BOUND, then again to show ASN-2/RATE, then again to show SP-2 alternating with a number (the default number is 000200). This is the Set Point 2 'high flow alarm' relay set point. The right-hand digit should be flashing. Press F1 or F2 to raise or lower this number. When it is showing the number you desire, press RST to move left to the 'tens' digit. Adjust this the same way, then press RST to move to the 'hundreds' digit and adjust that. When you have the number set the way you want, press PAR to cycle through the remaining parameters

TRC-2/ACNTLD

TYP-2/HI

STB-2/NO

HYS-2/0000

TOFF-2/00.00

TON-2/10.00

SPSEL/NO

PRO/NO

END - followed by a return to normal operation.

If too many of the parameters are accidentally changed to unknown values, it is easiest to download the current program values from a laptop computer. If a computer is not available, refer to the printed setup listing in the Appendix to these Instructions.

6. Programming - Automatic

The Lacquer Tracker is based on the industry-leading PAXI panel meter supplied by Red Lion Controls. Vertex has added a microprocessor control system within the meter housing, which enables the user to set the low flow alarm level quickly and easily by pressing a button. The various parameters of the panel meter are preset by Vertex before the unit is shipped, but can easily be changed by the user if necessary. This can be done manually by pressing the front panel buttons (see the next section), or automatically with the help of a laptop (or desktop) computer connected to the serial data connector socket on the rear panel of the unit. The serial communication cable is a standard 'straight-through' cable suitable for connecting a 9-pin male serial connector on the laptop to the 9-pin female connector on the back of the Lacquer Tracker panel. Only pins 2, 3, 5 are in use.

NOTE: to program the meter from a computer, you must first move the slide switch on the rear panel of the Lacquer Tracker to the rear. Don't forget to return the switch to the front afterwards for normal operation!

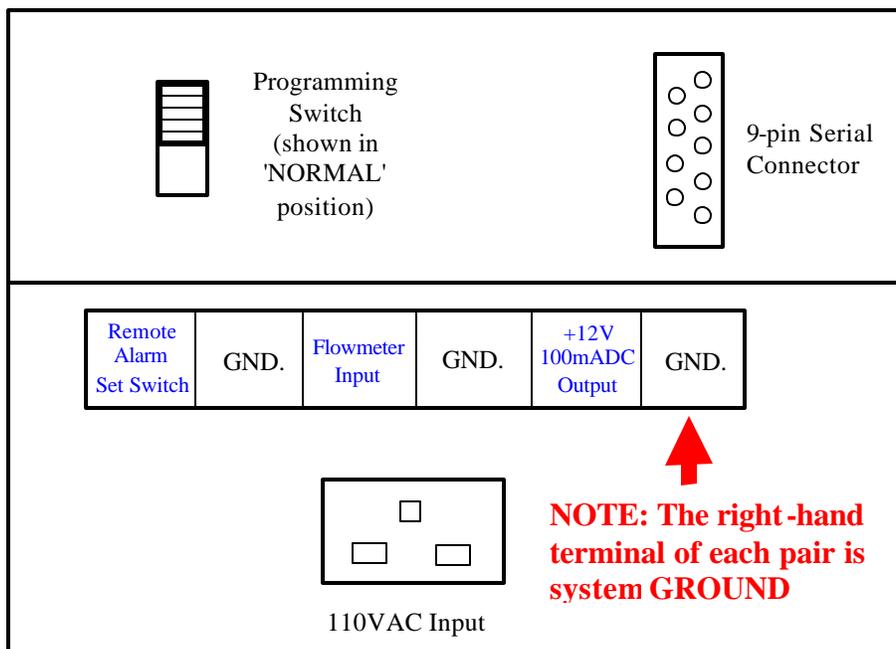
The control program is supplied on disk, and needs to be installed in the computer before attempting to program the unit. To install the program, put the disk in the computer's disk drive and run the 'setup.exe' program. Copy the default 'FLOWMTR1.PAX' file to the drive where you have installed the program - this is the Vertex-supplied setup file already installed in the meter. Click 'No' to messages offering to upgrade the file to a different version. If you open this file, you can examine the parameters installed in the meter. If you wish to make changes, we recommend that you first 'Save As' the file to a different name, to avoid losing the default parameters.

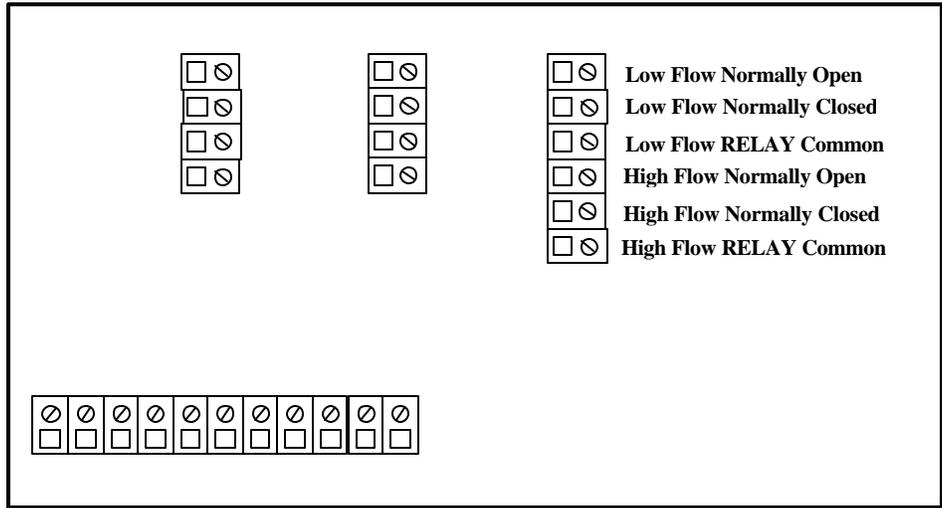
Once you have a duplicate file saved under a different name, you can make changes as desired, then 'download' the new settings to the meter. Be sure that the communications settings on both the laptop and the meter are 2400 bps, 8 bits, no stop bit, no parity (these will automatically be set on the laptop if you open the FLOWMTR1.PAX file or a duplicate copy before starting a download). See the manual programming instructions below to check the meter settings if an attempted download fails.

At any time, you can 'upload' the present program from the meter to the laptop to verify that it contains the parameters you wish.

Using the automatic method is recommended for situations requiring a lot of parameter changes (such as re-calibration for different flowmeter types), but the manual method is much simpler for minor changes (see below), and does not require a computer. Refer to the help system installed by the program for much more detail.

7. Wiring Connections (Rear Panel).





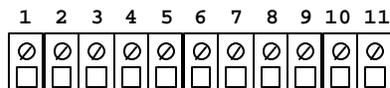
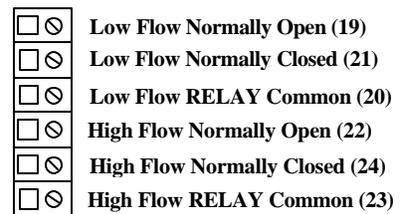
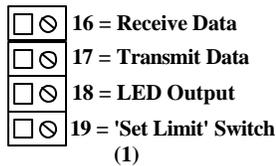
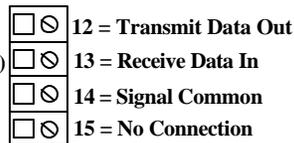
8. Internal Connections.

The Lacquer Tracker can be used in a smaller 1/8 DIN format (48x96mm panel cutout) by dismantling the unit and making connections directly to the rear panel of the main unit (see below).

**When meter is installed without 1/4 DIN cabinet, wire:
12 to 16
13 to 17 and use 110V AC supply filter (Corcom type)**

**Vertex Microcontroller Location
?**

- 1 = 110VAC~
- 2 = 110VAC~
- 3 = +12V 100mA DC (5)
- 4 = Common (4, 15)
- 5 = Input A (14)
- 6 = Input B
- 7 = User input 1
- 8 = User input 2
- 9 = User input 3
- 10 = User input Common
- 11 = Prescaler Output



When replacing an earlier-style Vertex Meter installation, refer to corresponding numbers in parentheses

9. Serial Connector 9-pin DIN female (socket) pin allocations:

- 2 Transmit Data (RS232) Output
- 3 Receive Data (RS232) Input
- 5 Signal Ground

Connects to a PC serial port via a 9-pin D-type serial connector with a standard straight-through serial extension cable (only pins 2, 3, 5 need to be connected). If you connect the Lacquer Tracker to an unusual system, you may have to reverse connections 2 and 3 in one end of the cable (use a 'null modem' cable or adapter). Standard serial communications parameters must remain as: 2400 baud, 8 bits, No Stop bit, No Parity.

10. CD-ROM.

This manual is supplied with an accompanying CD-ROM disk. The files on this disk are:

SETUP.EXE	The setup file to install the program on the laptop
SETUP.BMP	A file associated with setup
SETUP.ZIP	A file associated with setup
DIBAPI.DLL	A system file
DUNZIP.DLL	Another system file
LICENSE.TXT	Important details of the software license
FLOWMTR1.PAX	The Vertex program pre-installed in the meter

In the folder 'DOCS':

LacquerTracker.pdf	This manual in Adobe PDF format
PAXI.pdf	An Adobe format manual for the PAXI meter
RelayCards.pdf	An Adobe format manual for the relay cards
SerialCard.pdf	An Adobe format manual for the PAXI serial card

In the folder 'COMPRESSED':

Paxv700.exe	A backup compressed version of the PAXI setup file
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APPENDIX

Vertex standard settings as supplied:

1-inp Group 1 - Counter A & B Input Parameters

a cnt	A CNT = Counter A Operating Mode	cnt
areset	ARESET = Counter A Reset Action	zero
adecpt	ADECPT = Counter A Decimal Position	0
ascfac	ASCFAC = Counter A Scale Factor	1.00000
ascalr	ASCALR = Counter A Scale Multiplier	1
acntld	ACNTLD = Counter A Count Load Value	500
a p-up	A P-UP = Counter A Reset Power-Up	no
prsen	PRSEN = Prescaler Output Enable	no
b cnt	B CNT = Counter B Operating Mode	none

2-fnc Group 2 - User Input and Function Key Parameters

usr-1	User Input 1	no
usr-2	User Input 2	no
usr-3	User Input 3	no
f1	Function Key 1	no
f2	Function Key 2	no
rst	Reset Key	dsprst
sc-f1	Second Function Key 1	no
sc-f2	Second Function Key 2	no

3-loc Group 3 - Display and Program Lockout Parameters

a cnt	Counter A Display Lockout	loc
b cnt	Counter B Display Lockout	loc
c cnt	Counter C Display Lockout	loc
rate	Rate Display Lockout	red
hi -	Max Display Lockout	loc
lo -	Min Display Lockout	loc
sp-1	Setpoint 1 Access Lockout	loc
sp-2	Setpoint 2 Access Lockout	loc
acntld	Count Load A Access	loc
bentld	Count Load B Access	loc
ccntld	Count Load C Access	loc
ascfac	Scale Factor A Access	ent
bscfac	Scale Factor B Access	loc
cscfac	Scale Factor C Access	loc
code	Security Code	000

4-rte Group 4 - Rate Input Parameters

rateen	Rate Assignment	rate-a
lo-udt	Low Update Time	000.3
hi-udt	High Update Time	15.0
rte dp	Rate Decimal Point	0
segs	Linearizer Segments	0
rdsp 1	Scaling Point 1 - Display Value	006000
rinp 1	Scaling Point 1 - Input Value	00100.0
round	Rate Display Rounding	1
locut	Minimum Low Cut Out	000005
hi-t	Max Capture Delay Time	020.0
lo-t	Min Capture Delay Time	020.0

5-ctrc Group 5 - Counter C Input Parameters

c cnt	Counter C Operating Mode	none
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6-spt Group 6 - Setpoint (Alarm) Parameters (Press F1 at initial 'SPSEL/NO' to select applicable Set Point 1 or 2)

lit-1	Setpoint 1 Annunciators	flash
out-1	Setpoint 1 Output Logic	nor
sup-1	Setpoint 1 Power Up State	off
act-1	Setpoint 1 Action	bound
asn-1	Setpoint 1 Assignment	rate
sp-1	Setpoint 1 Value	set in use
trc-1	Setpoint 1 Tracking	acntld
typ-1	Setpoint 1 Boundary Type	lo
stb-1	Standby Operation	yes
hys-1	Setpoint 1 Hysteresis (rate)	0000
toff-1	Setpoint 1 Off Delay	00.00
ton-1	Setpoint 1 On Delay	10.00
lit- 2	Setpoint 2 Annunciators	flash
out- 2	Setpoint 2 Output Logic	nor
sup- 2	Setpoint 2 Power Up State	off
act- 2	Setpoint 2 Action	bound
asn- 2	Setpoint 2 Assignment	rate
sp- 2	Setpoint 2 Value	set in use (default is 000200)
trc- 2	Setpoint 2 Tracking	acntld
typ- 2	Setpoint 2 Boundary Type	hi

stb- 2	Standby Operation	no
hys- 2	Setpoint 2 Hysteresis (rate)	0000
toff-2	Setpoint 2 Off Delay	00.00
ton- 2	Setpoint 2 On Delay	10.00

7-srl Group 7 - Serial Communication Parameters

baud	Baud Rate	2400
data	Data Bits	8
addr	Meter Address	00
abrv	Abbreviated Printing	yes
opt	Print Options	no

8-ana Group 8 - Analog Output Parameters (Not applicable to this unit)

9-fcs Group 9 - Factory Service Parameters

d-lev	Display Intensity Level	3
code	Code	050

END