Installation and programming guide

TM6400

64 CHANNELS FLOW MONITORING SYSTEM AND TRANSMITTER

Auper

GENERAL INFORMATION

FCC INFORMATION

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference and, (2) this device must accept any interference received including interference that may cause undesired operation.

Note: The user is cautioned that any changes or modifications not expressly approved by the party responsible for FCC compliance could void the user's authority to operate the equipment.

LIMITED 5 YEAR WARRANTY

Auper Electronic Controls Inc. warrants that this product is in good working condition, according to its specifications at the time of the shipment, for a period of FIVE (5) years from the date of purchase. Should the product, in Auper Electronic Controls Inc opinion, malfunction within the warranty period, Auper Electronic Controls Inc. will repair or replace the product without charge. Any replaced parts become the property of Auper Electronic Controls Inc. This warranty does not apply to the software component of a product or a product which has been damaged due to an accident, misuse, abuse, improper installation, usage not in accordance with product specifications and instructions, natural or personal disaster or unauthorized alterations, repairs or modifications.

THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT (AT AUPER'S OPTION) ONLY AND DOES NOT INCLUDE ANY LABOR OR TRANSPORTATION CHARGES OR COMPLIANCE WITH ANY FEDERAL, STATE OR LOCAL LAWS, CODES OR REGULATION.

Notice of any claimed breach of said Warranty must be promptly given to the Auper authorized dealer from whom the product was purchased or leased. Upon request, all systems or parts which are claimed to be defective must be made available for inspection by and/or return to (at AUPER'S option) such authorized dealer and/or Auper. No repair or replacement under said warranty will extend the original warranty period.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, ORAL OR WRITTEN, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATIONS

All warranty for this product, expressed or implied, are limited to five years from the date of purchase and no warranty, expressed or implied, will apply after that period. No warranties for this product expressed or implied will apply to any person who purchases the product in used condition. The liability of Auper Electronic Controls Inc. with respect to any defective product will be limited to the repair or replacement of such product.

In no event shall Auper Electronic Controls Inc be responsible or liable for any damages arising

(a) from the use of the product;

(b) from the loss of use, revenue or profit of the product; or

(c) as a result of any event, circumstances, action or abuse beyond the control of Auper Electronic Controls Inc.; whether such damage be direct, indirect, consequential, special or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.

Disclaimer of Other Warranties and Liabilities

While all reasonable care has been taken in preparation of this product, it is provided “as is,” without warranty as to performance or fitness except as expressly stated above. The entire risk as to the quality of output developed with this product is assumed by the user.

Auper Electronic Controls Inc does not warrant that the software or system will meet any particular requirements of the user, other than as expressly stated above, and specifically denies any liability for incidental or consequential damages resulting from the use of this software or system.

Auper Electronic Controls Inc also specifically denies all liability for any technical or editorial omissions in its product documentation, and for any incidental or consequential damages resulting from the furnishing, performance or use of its documentation.

TM6400

Real-time flow monitoring system

Package

- TM6400 control unit
- 12 Volts DC transformer @ 1.5 amp min
- Flow meter collector box (1 of 4)
- 25 ft (7.62 m) flow meter collector cable
- 10 ft (3 M) serial cable or Cat 5 network cable

OPTIONAL

- WiFi adapter
- USB to serial adapter
- Serial printer
- Draft Manager Live software

INSTALLATION

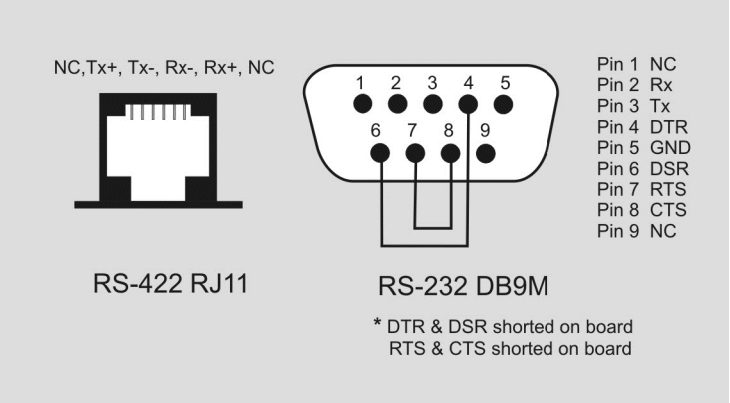
POSITIONING YOUR SYSTEM

The TM6400 being a control system, should receive the same installation considerations as an alarm system. It should be installed in such a way as to be tamper proof that you choose to install it at the bar, outside the beer cooler or, in the manager's office. Cables and connections should be protected and secured out of reach. The **power source should not be installed where it can easily be disconnected**. Do not connect the TM6400 power source to an electrical outlet that can be turned off at night.

COMMUNICATION

The TM6400 is equipped with two programmable serial ports and an Ethernet adapter to connect it to a computer network.

The RS-422 port serial port connector is a RJ11 jack (phone jack). The RS-232 port connector is a Dsub 9 pin connector (male)



RS-422 SPECIFICATIONS

- **Standard EIA** RS-422 Physical Media Twisted Pair Network Topology Point-to-point
- **Maximum Distance** RS-422 1000 metres (3000 ft)
- **Mode of Operation** Differential
- **Maximum Baud Rate RS-422** 115.2 Kbytes

- **Voltage Levels** −6V to +6V (maximum differential Voltage)
- **Mark(1)** Negative Voltages
- **Space(0)** Positive voltages
- **Available Signals** Tx+, Tx-, Rx-, Rx+ (Full Duplex)
- **RS-422 connector type** RJ11
- Using RS-422 and the Auper AP821 RS-422 eight port hub, you can link several Auper metering systems to the same RS-232 serial port or USB port of a computer or printer.

RS-232 SPECIFICATIONS

The RS-232 port can be used with one system connected directly to a serial port of a computer running with the Draft manager software.

- **Maximum distance RS-232** 15.25 metres (50 ft) with straight cable or 44 metres (147 ft) using UTP Cat 5 cable
- **RS-232 connector type** DB9 male
- **Maximum Baud Rate RS-232** 115kbit/s

ETHERNET ADAPTER

The TM6400 is available with an optional Ethernet adapter you can use to connect one, or several TM6400, directly to your computer network to use the Draft Manager Live software. Once connected to a network port, the adapter can be found and configured by remote login by our technicians from any PC on the same network. This is done at the same time as the software installation.

The system is also equipped with a real-time interface. The TM6400 will send the amount served through the Ethernet or serial port two seconds after the flow meter has stopped recording following a special communication protocol. To use this feature, you must use the Draft Manager Live software.

RED LED POWER FAIL INDICATOR

The red LED on the TM6400 will flash to signal that there was a power failure. To stop the LED from flashing you will need to enter your administrator code.

CONNECTING THE FLOW METERS

Figure 1 TM6400 Collector box

Follow the instruction sheet supplied with the flow meters for complete step by step instructions on how to install the flow meters. Videos are also available on the Auper YouTube channel accessible from the web site. The flow meters will be connected to one or 4 flow meter collector box. The collector boxes are designed to be mounted in beer coolers. Since the flow meters are supplied with a 25 ft (7.6 M) cable, you should try to position each collector box in the beer cooler to reach as many flow meters as possible. Flow meter cables can be extended should you need to.

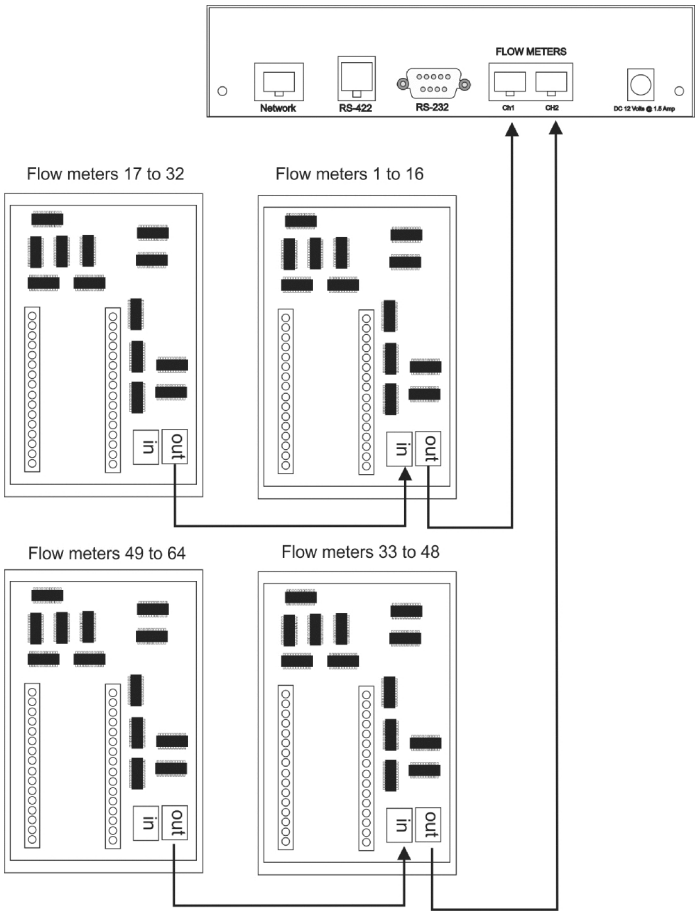
WARNING:

The power to the collector boxes comes from the TM6400 through the collector cables. Always disconnect the power to the TM6400 when working on the collector(s) or, when connecting or disconnecting the collector cables.

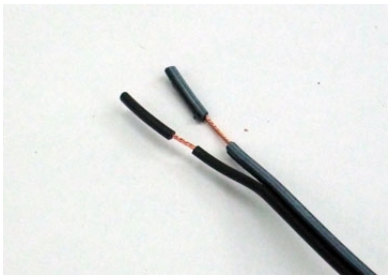
One collector box is able to take up to 16 flow meters. Up to four collector boxes can be connected to one TM6400 for a total of 64 flow meters per system.

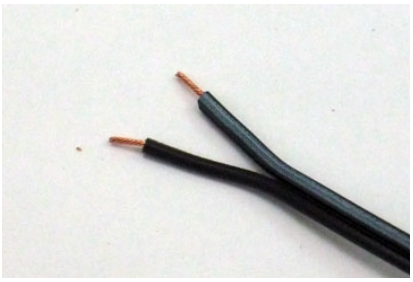
You will connect the collector boxes to the TM6400 using a regular Cat 5 network cable terminated with RJ45 connectors.

Cables are available for up to 150 ft (46M). Longer cables can be made on demand and can reach 300 ft (100 M). This is the same kind of cables used for computer networks. You can find them in computer stores or have them installed by local computer network contractors. **However, you must not connect the collector cables to the computer network and each cable should be tested priot to connecting it to the collector and TM6400 system..**

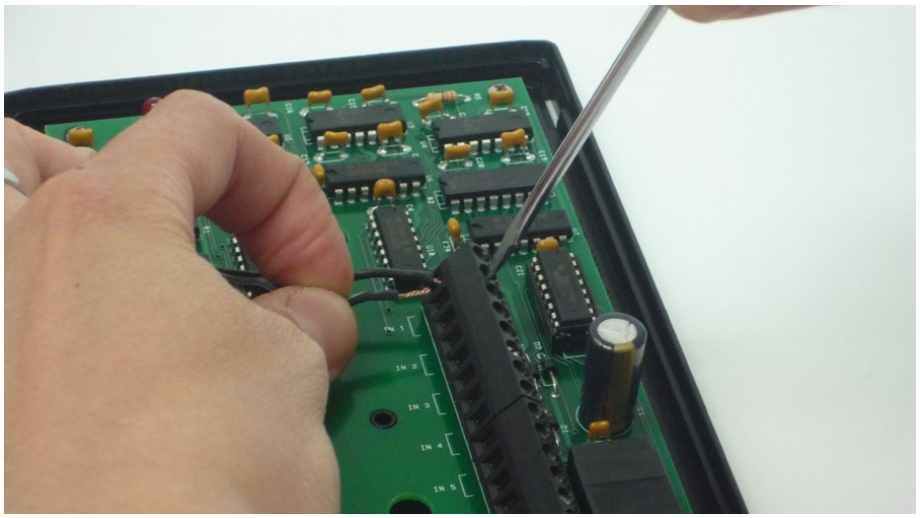


There are two channels on the TM6400 each able to take one or 2 collector boxes. Channel 1 on the TM6400 (flow meters No.1 to 32) will take one or two collector boxes. The second collector boxe (flow meter 17 to 32) connects to the first collector box using the OUT connector to the IN connector of the first collector box. The same goes with channel 2 for flow meters 33 to 64.





The ends of flow meter cables have been stripped at the factory. Twist the wire and then pull the insulation off the wire. Cut the copper wire to get ¼ in (6mm) exposed only.

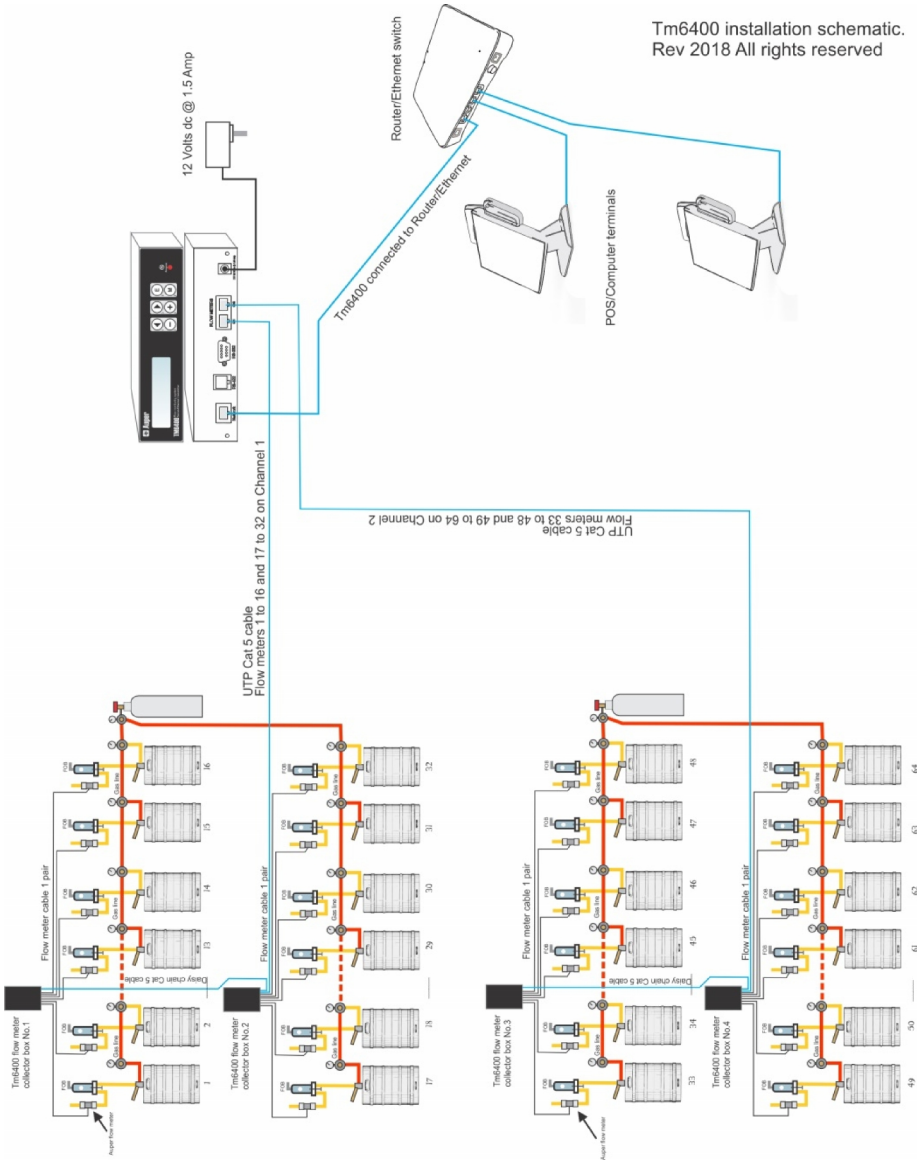


Auper flow meters do not need an external power source. There is no voltage going to the flow meters so you cannot damage them even if you touch the wires. There is no positive or ground either. You do not have to worry about polarities.

Connect the flow meters to terminals 1 to16 and tighten the screws to secure the connection. DO NOT OVER TIGHEN AS YOU MAY CUT THE WIRE.

Inspect your connections before closing the cover to make sure that no wires are touching each other. If two wires are touching, the flow meter signal will be shorted and the flow meter will not send any signal to the TM6400.

Connect the network cable to the collector box. Secure all your cables using cable ties. Loose wires should be secured using cable ties.



CONNECTING THE TM6400

Warning: Although the collector box cable is the same as computer network cables, the collector box is not a network device. DO NOT CONNECT THIS CABLE TO ANY SWITCH, ROUTER OR OTHER ETHERNET DEVICE.

Run the Cat 5 network cable between the junction box and the TM6400 system.

Securing the connector

Use small cable ties to secure the connector in place. Slip the cable tie between the connector's body and the tab. The cable tie will prevent the tab from being pressed thus preventing anyone from disconnecting the cable.

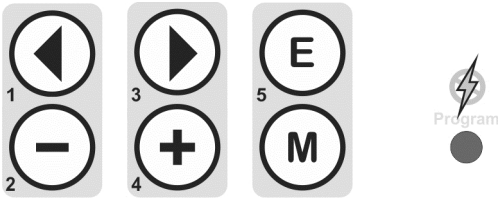
Securing the flow meter cables and collector box cables will prevent people from tampering with the flow meter system. You should visually inspect the cables regularly.

POWER SUPPLY

Use a 12 Volts DC transformer at minimum 1.5 A to power the TM6400.

Connect the transformer to a power outlet. Avoid using inexpensive power bars as the transformer may fall and disconnect. Make sure the power source cannot be disconnected by the staff. A UPS (battery backup) is an added security since it will supply power to a TM6400 for a long time in case of power failures insuring continuous power to the unit.

POWER UP AND SET UP



The button serves several functions.

1. The numbers will be used for passwords.
2. Arrow signs pointing left and right will be used to move the cursor, select the line numbers or ports viewed.
3. The minus and plus sign are used to increase or decrease values.
4. The E (enter) button will be used to validate a choice.
5. The M button will be used to change mode.
6. The LED will blink in case of power loss.

Passwords:

Two different passwords can be programmed

- Administrator
- Line cleaning
- The default factory passwords are **1 2 3 4** followed by E (enter).

```
1:RESET   2:CLEAN
3:SET UP  4:EXIT
```

PRESS AND HOLD M and then Press E to enter the programming modes.

You will be asked to enter a password after your selection.

1.RESET COUNTERS

```
1:RESET   2:CLEAN
3:SET UP  4:EXIT
```

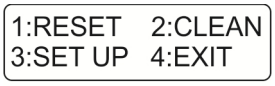
Press 1 followed by the password and press E.

```
ACCESS CODE:
1 2 3 4
```

The system will clear the 64 counters. The counters should not be cleared when using the software.

```
COUNTERS CLEARED
```

2.CLEANING MODE



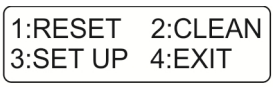
Press 2 followed by the password and press E.

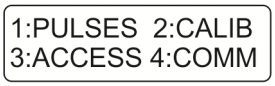
This puts the system in line cleaning mode. The counters are disabled when left in this position.

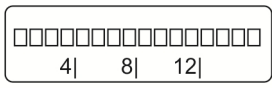
Press 6 (M) to exit.

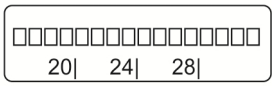
3. SET UP

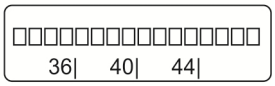
Press 3 followed by the password and press E.

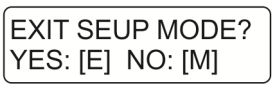












1 IMPULSE MODE

Press 1 to enter this mode.

From left to right, 16 dots representing flow meters 1 to 16.

Press the arrows left or right to move the bank of flow meters showed on display (1 to 16, 17 to 32, 33 to 48, 49 to 64)

The numbers below the pulses (4, 8, 12. 20, 24 ….) followed by a bar are indicators to help you determine which flow meter number you are looking at.

- When a flow meter is connected to a line, the corresponding dot is up.
- If no flow meter is connected to a line, the corresponding dot is down.
- When a flow meter detects liquid flowing through it, the corresponding dot will alternate up and down.
- If a flow meter is installed backward, the corresponding dot will be up but will not alternate when product is flowing.

You can verify that your flow meters are connected and registering by serving a little bit of beer at each faucet.

If you had not yet removed the air pocket from your beer lines, now is the time to do it.

Press M to exit. [Pulse done?]

Press E to confirm.

2. Calibration (Please read carefully)

```
1:PULSES  2:CALIB
3:ACCESS 4:COMM
```

```
CAL. WITH 20.0
< | >: 1-3    - +: 2-4
```

```
CAL. WITH 01.0
< | >: 1-3    - +: 2-4
```

```
CAL. WITH 00.5
< | >: 1-3    - +: 2-4
```

```
C01  0000->00.0000
SET ONE: 4   ALL:E
```

```
C01  0300->00.0000
SET ONE: 4   ALL:E
```

```
C01  0000->00.0666
SET ONE: 4   ALL:E
```

```
CALIB.  DONE?
YES: [E]  NO: [M]
```

The TM6400 can be set to measure ounces, litres, gallons etc... To calibrate, you will serve a measured amount of liquid into a graduated cylinder during which time the system will count the number pulses sent by the flow meter. The initial sampling value on display is 20.0 (for 20 Oz).

If you plan on counting ounces leave it there. 20 ounces measured in a graduated cyclinder at each beer tap is a sufficient amount to calibrate the metering system accurately. Less will reduce the accuracy and more is not necessary.

To count litres, you could use a sampling value of 01.0 liter but a half litre (00.5) is sufficient to calibrate the metering system accurately. Less will reduce the accuracy and more is not necessary.

To count one for the amount served in a glass (a pint), use a sample value of 01.0.

The cursor can be moved left and right using the arrow buttons.

Use the + and - to increase or decrease the value.

When you have selected the sampling value to be measured in a graduated cylinder, press M to start.

How to sample:

TIP: *For draft beer, you can kill the foam by spraying WD40 into the graduated cylinder before serving. You can stop to let the foam settle down when you are in calibration mode. WD40 does not work with Stouts and Cream Ales. DISPOSE OF THE CONTENT OF THE CYLINDER INTO THE SINK. DO NOT SERVE!!!*

Serve and measure as accurately as possible the sampling value using a graduated cylinder at each beer tap. You should calibrate when the bar is closed. Serving beer to customers while trying to calibrate the system may cause errors and inaccurate measurements.

After you have served the amount, you can calibrate the flow meters all at once or, a few at the time. The number of flow meter pulses registered by the flow meter after the sample value has been served will be on display to the right of the flow meter number.

```
C01  0300->00.0000
SET ONE: 4   ALL:E
```

Use the arrow buttons to display the other flow meters.

Press the No.4 button (+) to calibrate the flow meter on display only.

Press the E button to calibrate all the flow meters that have pulses registered after serving the sampling value.

The value on the right will change to the new calibration value. You can view the calibration values of each line by pressing the arrow buttons.

```
C01  0000->00.0666
SET ONE: 4   ALL:E
```

In calibration mode, when beer has not been served at some beer taps, the registered pulses will remain “0000”. The system will not recalibrate even if you press E to calibrate ALL. Therefore, you can do some of them, press E to calibrate and move on to other beer taps as long as ones already calibrated are not used.

RE-SAMPLING

If you have exceeded the amount to measure at one or more of the beer tape, note which of the taps and move on to measuring the other ones. After pressing the E button to calibrate all the flow meters, you can come back and resample the one(s) you are not satisfied with.

Press M to exit calibration mode

Press E to confirm.

1:PULSES 2:CALIB
3:ACCESS 4:COMM

ENTER NEW CODE:
(ADMINISTRATOR)

ENTER NEW CODE:
(LINE CLEANING)

ENTER NEW CODE:
1234

ACCESS DONE?
YES: [E] NO: [M]

3. ACCESS

Press 3 to change the two passwords. We recommend using a password that is simple and easy to remember.

If you do not want to change the first password (administrator), press E to skip.

Buttons No. 1 2 3 4 and 6 can be used to enter a password up to 7 digits long.

Press and hold M while pressing E to delete the last number entered to make corrections.

Press E to validate your entry and exit.

1:PULSES 2:CALIB
3:ACCESS 4:COMM

SYSTEM NUMBER 00
- | +: [3] - [4]

RS-232 LINK
BAUD RATE 115.2K

RS-422 LINK
BAUD RATE 9600

ETHERNET LINK
BAUD RATE 115.2K

WIFI LINK
BAUD RATE 115.2K

FIRMWARE: V1.0A
MCU:AT89LP51RB2

EXIT SETUP MODE?
YES: [E] NO: [M]

4. COMM

Press 4 to enter COMM mode.

System number 00

The system number is used to communicate with the Draft Manager Live software. The default number is 0. If you have one TM6400, leave it at 0 since the default number in the software is also 0. If you have more than one TM6400, you can change the number of the other systems to 1, 2 3 etc…. Each TM6400 has to be set with a different number when on the same network. Two systems with the same number will cause an error since both will respond to the same command sent by the software.

Press + or - to increase or decrease the system number.

Press M to go to the next mode

Use the Arrows to select the port used to communicate with the computer.

Choose RS232 if you connect the TM6400 directly to a PC using a serial 9 pin to USB cable.

Choose RS422 if you connect the TM6400 to an Auper AP821 HUB to link several system to the same RS-422 network.

Choose Ethernet link if you connect the TM6400 directly to your computer network using the Ethernet switch or router.

Choose WIFI link if your TM6400 is equipped with this option.

Press the + or – button to change the baud rate which is the speed of transmission between the TM6400 and the PC.

9600 is the default Windows baud rate. If you change it in the TM6400, it has to be changed in the software as well.

The TM6400 is designed to operate at 115.2 K for a much faster transmission rate.

Press M to go to the next mode.

5. FIRMWARE

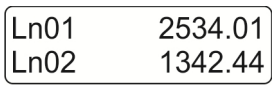
This mode serves to identify the firmware version and micro processor unit installed in your TM6400.

Press M to exit.

The system asks [COMM. DONE?]

Press E to exit COMM mode.

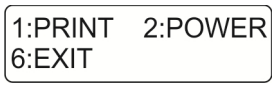
OPERATION



RUN MODE

In Run mode, you see the counters on display.

Press the arrow buttons to view the other counters.



Press M to select one of two options:

Press 1 to print a report to a serial printer.

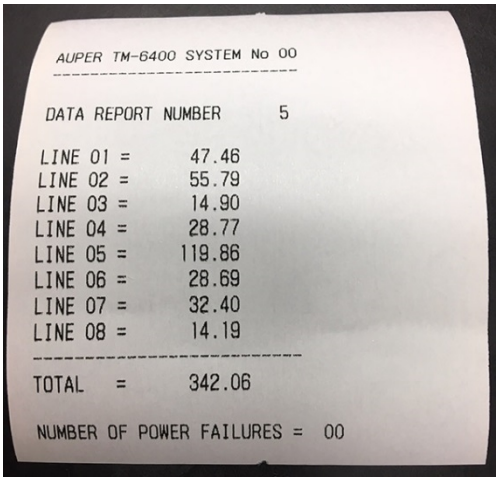
Press 2 to reset the power fail counter.

Enter the password and press E to validate.

ANNEX

SERIAL PRINTER SETTINGS

- Baud rate: 9600 to 115.2 K
- Parity: none
- Stop bit: 1
- Handshaking: Xon/Xoff
- Print columns: 40



USB TO SERIAL CONVERTER

USB to serial converter

Most computers are not equipped with 9-pin serial ports. A USB to serial adapter must be used. Drivers are provided with the converter and must be installed on the computer. Windows will assign the serial port automatically. You can find to which port your converter has been assigned at:

Control panel/system/device manager/ports (Com & LPT)

Default Windows serial port settings:

- 9600 bps
- bits
- no parity,
- 2 stop bits
- Flux control to none.

P/N: 70-080

Use with Auper null modem serial cable P/N: 70.010

RS-422 SERIAL PORT CONNECTIONS

You will use the RS-422 port for the following reasons:

- You do not have an available computer network to use the network adapter.
- You wish to connect your TM6400 to a computer more than 150 ft (50M) away.
- You have more than one metering system that you want to connect to the same computer or printer.

RS422 modular cable

Short distance RS-422 connections (no more than 50 ft/ 15M) can be made using flat modular cables. The cables will connect directly from the system(s) into the AP821 hub. (Order the cables separately P/N 70-040-X). Modular cables are not twisted and offer no protection against ambiant noise.

RJ11 jacks

Long distance RS-422 connections can be made using UTP **Cat5e 2 pair cable** terminated with RJ11 jack. You can order those from the factory.The cables must be inverted if you make your own.

P/N: 70-042-X (X = length)

DRAFT MANAGER LIVE SOFTWARE INSTALLATION OVERVIEW

The Draft Manager Live software will be installed by Auper Electronic Controls using a remote access software called TeamViewer. Teamviewer is free of charge for the end user and can be downloaded from their web site.

Draft manager Live must be installed on a PC running Windows 7 or better. The PC must be set to remain ON 24/7.

To interface with the POS,the PC must be on the same computer network as the POS. It can be a wired (prefered) or WIFi connection.

The IP address of the computer hosting Draft Manager Live must be set to static (not DHCP). A change in the IP address would disconnect the TM6400 system (unless connected by COM port) and the POS if interfaced.

The software is equipped with a tool to find the Auper devices connected to the computer network. The tool enables the technician to configure the IP of the host computer and the speed of transmission. The TM6400 will always reconnect to computer with the set IP address upon being powered on. The software must be running to establish the connection with the TM6400.

Once the software communicates with the TM6400, the list of beer is created in the database and assigned to the flow meter number measuring it.

Upon turning the Live view monitor, the system is ready to report the time, brand and amount served in real-time.

The POS interface is simple and works with most POS systems on the market without requiring the POS software company to write software, or send files to interface with the Auper software. The interface communication is achieved by computer network as opposed to a serial computer link. No cables are required.

Auper recognizes that many clients and POS software vendors will want to test this interface prior to paying for software. We will login, install the software free for 30 days and set up the system to register the draft beers ordered in the POS free of charge.

NOTES:

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Quality - Precision - Durability

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Manufacturer of quality control systems since 1985.