

# INSTALLATION

## 1.1 Installation Requirements

This instruction applies to installation of replacement computer system with updated ProControl Furnace software on a Microsoft Windows 10 computer on LCI, FurnacePros and RTC IR furnaces with Opto22 LCM4 controller and SNAP or G4 racks and I/O.

## 1.2 Tools and Parts

Following is a list of items required for a successful installation. Some items may not be supplied with the computer, but nevertheless should be included.

Required	Optional
Furnace Computer	USB-A to USB-B Cable (optional depending on location of computer, connect computer to monitor)
Opto22 LCM4 Controller with M4SENET-100 Ethernet card	Ethernet surge protector, PoE (optional)
1024x768 Monitor (Standard 4:3) with USB (VGA or HDMI to match computer port)	Ethernet Cable, standard, 1 meter (optional to connect surge protector to LCM4)
VGA or HDMI cable (2-5 meters to run from computer to monitor)	Drill motor drill bit and screwdriver (to attach surge protector)
Ethernet Cross-over Cable (2-5 meters to run from computer to LCM4)	
USB Keyboard, USB Optical Mouse, mousepad	

## 1.3 Schematic

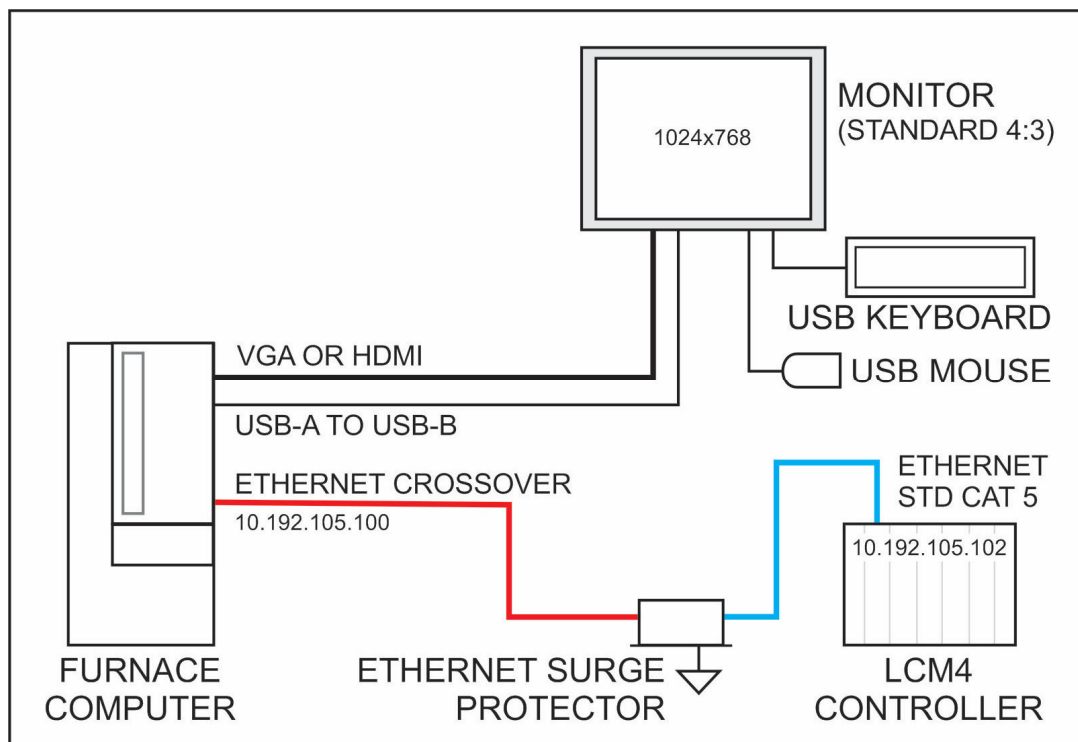


Figure 1-1 Furnace Computer Schematic

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### 1.4 Installation

- 1) Disconnect and remove existing computer.
- 2) Position new computer and secure with ready access to power button and optical drive.
- 3) Connect standard (4:3) monitor VGA (or HDMI) and USB ports to computer (see fig 1-1).
- 4) Connect USB keyboard and USB mouse to monitor USB ports.
- 5) Connect computer and monitor to 117V power source (can be unswitched, or switched with furnace ON).

**CAUTION: ELECTROSTATIC SENSITIVE DEVICE**

**Make sure you discharge any static charge before touching LCM4 Controller. Even a slight discharge can result in severe damage to the controller.**

- 6) Connect LCM4 Controller to computer using Ethernet crossover (red or orange) cable. Plug the crossover cable into Ethernet port on computer motherboard (not aux card port). Plug other end in either an Ethernet Surge Protector (recommended) or directly into Ethernet port on the LCM4 controller. If an Ethernet Surge Protector is used, the cable between the surge protector and the LCM4 controller must be a Standard Ethernet (CAT5 or higher) cable.
- 7) Do not connect furnace computer to the internet, except if so instructed by the factory for troubleshooting.

### 1.5 Initial Startup

- 1) Start Furnace. Turn ON computer and monitor if they do not power up with furnace. Note Windows startup is delayed slightly to allow controller to boot first.
- 2) Furnace program loads automatically. Exit furnace program (right click on LCI app in the taskbar and select close window, Yes).
- 3) Click on Download icon (on desktop, toolbar, or start menu). Click OK to close Download Completed window.
- 4) Start Furnace program using furnace icon (on desktop, toolbar, or start menu).
- 5) Furnace program loads a factory default recipe. This is NOT the same as a default recipe that may be found in the R:\ directory.
- 6) On Security screen, select User or Engr from user. Enter password (1 for operator, 2 for engineer). Engineer level allows creation of new users at Engineer or Operator level.
- 7) On Recipe screen, in Send to Furnace window, click Send from Disk and select from list. Recipe in Furnace window will change to selected recipe.
- 8) Go to Process screen, operate furnace belt. Check belt speed. If inaccurate, go to Maintenance/Calibrate and calibrate belt (see section 3.9.3 Belt Speed Measurement and 3.9.4 Belt speed Calibration).
- 9) Go to Process screen, operate furnace normally.

### 1.6 Screen Resolution

The furnace program is designed for a fixed resolution of 1024x768. If the Process screen does not fill the monitor screen, right click on the desktop and select Display Settings. Use the Resolution dropdown and select 1024x768. Close Display Settings window.

## 1.7 Windows 10 LTSC

Microsoft Windows 10 LTSC is a Long-Term Service Channel designed for medical and industrial applications where stability and reliability are the priority. This version has a 10-year update cycle. Once properly configured, the OS does not need to be updated and, in fact, updates post installation updates can cause the computer to fail to operate with the furnace properly.

## 1.8 Network and Internet

The furnace uses a private network and is normally connected to the primary Ethernet port on the computer motherboard. A second Ethernet port or USB WiFi can be used to connect to a network or the internet. Only connect the computer to the internet if so instructed by the factory to facilitate remote troubleshooting. TeamViewer has been installed on the computer to allow the factory to connect to the computer remotely for troubleshooting purposes.

## 1.9 Troubleshooting

Download. If Download fails, perform the following, checking Download after each change:

- 1) Unplug and reinsert the Ethernet cables. Check Download.
- 2) Verify cable to furnace is a cross-over cable and is plugged into the motherboard Ethernet port.
- 3) Verify the motherboard Ethernet port is addressed 10.192.105.100 (subnet 255.255.255.0)
- 4) Make sure LCM4 controller starts and is up and running before computer furnace program loads. If both furnace and computer start together, the Opto22 controller will normally be up and running before the furnace program completes loading.

## 1.10 Remote Troubleshooting

If the factory is to provide remote support:

- 1) Connect furnace to internet.
- 2) Turn furnace on.
- 3) Start TeamViewer. Provide factory with ID and password.
- 4) Factory can proceed to connect to the furnace computer.

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### 1.11 Factory Controls Upgrade Tasks

#### 1.11.1 Prepare New Computer and PLC Interface Components

The following items were completed by FurnacePros at FurnacePros facility:

- 1) Configure Window®10 LTSC OS and load furnace control software.
- 2) Load and test furnace software on LCM4.
- 3) Collect installation cables and hardware if included in kit.

### 1.12 On-Site Startup Tasks

Tasks typically performed during startup by the Service technician include:

- 1) Prepare the machine for operation.
- 2) Apply power and bring up the machine to a fully operational state.
- 3) Verify PROCESS READY by starting furnace.
- 4) Verify Software operation, logging, recipes, and alarm functions.
- 5) Run through the installation test and checkout procedure.
- 6) Verify Belt Speed
- 7) Verify Warm-up and Process Ready
- 8) Verify low pressure alarm settings and alarm functions
- 9) Identify and report any deficiencies noted in the installation of the machine.
- 10) If training has been included, a manufacturer's representatives shall train the appropriate personnel in the customer's plant on furnace startup, shutdown, operation and necessary preventive maintenance at the furnace.
- 11) Replace Covers. Before operation for production, install any covers that were removed during the functional checkout.

**NOTE:** All functions must operate properly before continuing. Refer to the Service Information section and correct any malfunctions before proceeding.

- 12) Turn over the machine to operations.