



# L3000<sup>®</sup> Series PLC

*Powerful, reliable PLC solution for critical applications*

# OVERVIEW

For efficient and effective water/wastewater systems, the L3000 provides automation, remote access monitoring, and control of vital systems.

TESCO's fully-automated L3000 also includes information management and the delivery of data, reports, and trends.

## Enhanced PLC Technology

The L3000 is a powerful programmable logic controller specifically designed to meet the critical needs of the water and wastewater industries. It easily integrates into a wide range of applications, from simple standalone stations to elaborate networked systems.

The L3000 has unique built-in features and leading advancements designed for reliability, ease-of-use, and cost effectiveness. The fully-programmable L3000, with multiple protocol compatibility and communication ports, offers the flexibility to utilize a wide range of equipment such as PLCs, OITs, instrumentation, power monitors, and radios. With I/O expansion modules, the L3000 becomes a perfect fit for remote standalone applications.

## Benefits

- ✓ View and modify registers and programs without a laptop
- ✓ Integrate multiple vendor PLCs into one control system
- ✓ Access and view documents from anywhere, using the integrated web server
- ✓ Built-in storage for documentation and drawings
- ✓ View vital information using L3000 remote data login
- ✓ Transfer data from PLC to PLC using flash drive & USB ports
- ✓ Winbench64™ programming software included free
- ✓ Fully-programmable operator interface
- ✓ Watchdog feature automatically restarts program
- ✓ Data logging capabilities with no SCADA required
- ✓ Expandable I/O modules allow for system growth



## Features

- Standard 5-year warranty
- Real-time register data monitoring & trending
- Touchscreen color HDMI display
- Flexible communications built-in
- Battery backed/protected memory
- Powerful WinBench64™ programming IDE
- HDMI video port and Tesco Touchscreen display
- Exclusive Brite Lite™ LED displays
- High performance, integrated web server
- Fast 1GHz Processor
- 57,600 Kbs serial port full handshake and 10/100 Mbs Ethernet port
- Open Architecture (VME Bus, ISAGRAF, hardware, etc.)
- USB and flash drive upload/download capability
- Sophisticated data logger
- Multiple protocols
- IEC 61131-3 compatible

## Communications

- TESCO™
- Data Express, Data Express Plus, DGH
- Modbus TCP/IP, Modbus Serial

## Options

- 10-year warranty
- Compact operator interface
- Full-size operator interface
- EMAS® service agreements

# TESCO® L3000® Series Programmable Logic Controllers

## Mobile Connectivity

### Web Server – true mobile connectivity

#### *View data from anywhere*

The L3000's internal web server lets you remotely view live data, and perform configuration, troubleshooting, and maintenance from anywhere in the world. The L3000's built-in web server stores all site documentation (drawings, O&M manual, programming and operation theory) within the device flash memory. Documents are always available onsite or remotely using any web browser, Telnet, SSH or FTP. Maintenance logs, site visits, and time/date log entries are easily stored from the web browser in the flash drive memory.



#### *View data on laptops, tablets, and mobiles*

View your data on multiple devices, from laptops and tablets to mobile phones. The L3000 web server has colorful, well-designed screens that clearly show data in real-time. Operators can add notes in the user log, upload documentation including O&Ms, drawings, and any PDF document. The web server can even program the system to email alarm notifications to operators and facilities.



#### *Transport programs and configurations between PLCs with a memory stick*

Experience true program file portability using a flash memory stick. Quickly backup existing programs, restore or download new programs, and easily transfer programs between PLCs. Data logging can also be transferred to the memory stick.

#### *View site status – without a laptop*

Each L3000 comes with your choice of operator interface displays. TESCO's **color HDMI touchscreen** operator interface is available in various sizes. It can be mounted next to the PLC, enabling you to retrieve live data, view alarms, watch trends, and remotely access other PLCs in the system—using touchscreen technology. Now you can interface with the PLC on easy-to-read colorful screens without a laptop!

TESCO also offers a standard **LED display and keypad** in small and large sizes. Operators can troubleshoot and program directly on the faceplate. Its tough exterior is built for rugged environments.



# TESCO® L3000® Series Programmable Logic Controllers

## Reliability

### *Continuous availability – QNX reliability*

Equipped with a series of features to ensure continuous availability, the L3000 is a robust system built on the QNX® Neutrino® real-time operating system (RTOS). This system complies with the POSIX (Portable Operating System for Unix) standard and is the preferred choice for critical systems such as aerospace, air traffic control systems, surgical equipment, and nuclear power plants.

The L3000's fast 1 GHz processor provides for simultaneous handling of the application program, web server, HDMI operator interface, and all telemetry communications.

Powerful built-in telemetry features keep the remote site online and connected to its communications network.

To prevent any loss of program or data during power outages, a battery-backed static RAM (PSU) aids in the retention of all the L3000 configuration data for the application control program, registers, and setpoints.

The built-in Watchdog Timer continuously monitors the L3000's operation and will automatically reset the unit in the event of errant operation.

### *Hot Standby redundant systems*

TESCO offers a unique "Hot Standby" bi-directional, true bumpless transfer system that keeps all equipment and systems running. It automatically switches to a secondary PLC in the event that the primary PLC fails, without interrupting the process. The secondary PLC continuously polls the primary for values to update the system and stay in synchronization. As a fail-safe measure, when a SCADA system polls the Hot Standby, only one IP address will register as the primary PLC. SCADA telemetry communicates with the primary PLC no matter which PLC has the primary duties.

## Efficiency

### *Upgrade and install systems easily*

The L3000 touchscreen is ready out of the box—there is no programming required. A **WinBench64™** programming IDE license is available free of charge from TESCO. The L3000 is fully backwards-compatible with the L2000s and the full line of TESCO PLCs for seamless integration. When upgrading an existing TESCO PLC to an L3000 CPU card, there is absolutely zero reprogramming or rewiring of the site needed.

### *Easy configuration/integration*

The L3000's fully-commented, **TESCODE™** program and configuration tables remove the guesswork to make the initial setup and ongoing maintenance straightforward. To speed up the installation process, the L3000 can transport program and configuration data between PLCs via memory sticks. No more hunting for legacy commented code: the L3000 stores the date-stamped commented code in the PLC memory.

### *Designed for industrial applications*

The L3000 was specifically developed to provide powerful, reliable control and monitoring for industrial applications. It operates reliably in humid and caustic environments, and can withstand temperatures up to 185° F. The controller is industrial-rated. L3000 circuit boards can also be manufactured with conformal PCB coating to resist humidity and corrosion.

A ten-year lithium battery ensures that the PLC configuration and files are retained in the event of a source power failure.



## Security

### *Open communication*

Flexible telemetry communications based upon open protocols provide easy integration and future expansion of the treatment system.

### *Open protocol – integrate with other PLCs/devices*

The L3000g can be used as a gateway device with message pass-through abilities – between Ethernet and serial ports, to connect any combination of TESCO or Modbus® devices. It can be networked in a variety of ways with other third-party PLCs, operator interfaces, and SCADA systems. It supports cellular modem telemetry; Modbus® serial and TCP.

The processor interface ports include:

- Four communication ports to allow communication with other controllers, operator interface products, and SCADA systems
- Three RS-232 serial ports
- One 10/100 Mbps Ethernet port
- Four fast USB 2.0 (1 internal) ports
- One HDMI video port to support TESCO's touchscreen interface or other HDMI devices
- External mouse support when using HDMI, large screen monitors, etc.

### *User authentication*

The L3000 provides user authentication functionality with multi-level password-protected operation. It controls levels of use to the appropriate operators. It also performs an automatic lockout after three incorrect login attempts (3 strikes and you're out).

## High-Performance Automation System



### Built for scalability – L3000 expands to meet your needs

The L3000 was developed to meet the needs of many types of operations, from small facilities to large multi-station treatment plants. The I/O configurations are customizable to meet facility requirements now and in the future. The L3000 gives you a choice of many I/O card types and chassis models with 3, 5, 12, or 24 card capacity. It supports hundreds of I/O points.

### TESCO Support

We offer world-class 24/7/365 support to keep you up and running in the event of a failure.

**Spare In the Air Program:** To expedite the repair process, TESCO will provide the parts you need by the next day. Return the failed part to us for repair.

Five-year standard warranty.  
For additional protection, an optional ten-year warranty is available.

## L3000 Programmable Logic Controller

### PROCESSOR

QNX® Neutrino® RTOS (POSIX)	This operating system has been qualified to meet various safety and security standards for use in products with high criticality and low tolerance for failure.
Texas Instruments OMAP 3730 – 1GHz ARM Processor	Able to process 10,000 program lines of code per second
512MB RAM	
64GB Flash Memory	
Battery-backed Memory	10 year lithium battery
Operating Temperature	Industrial rated at 185° F

### BUILT-IN WEB SERVER

User Authentication	
Protected Communication Protocols	Telnet (SSH), FTP (SCP, SFTP),
Real-Time Data Access and Control	Real-time read and write register values, Active trending data value screen
Log Entry Feature	Maintenance, site visits, additional functions that require logging

### COMMUNICATION PORTS

4 Fast USB 2.0	1 internal
1 10/100 Mbps Ethernet	
3 RS-232	Full-handshake

### CHASSIS OPTIONS

3, 5, 12, or 24 Cards	3U VME parallel bus low-power architecture
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### PROGRAMMING LANGUAGES

IEC 61131-3	Sequential Function Chart (SFC), Structured Text (ST), Instruction List (IL), Function Block Diagram (FBD), Ladder Diagram (LD)
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### COMMUNICATION PROTOCOLS

Modbus TCP, Modbus RTU	
Tesco protocols	Data Express, Data Express Plus, DGH
Tesco	TESCODE™, Winbench64™

### OPERATOR INTERFACE TERMINALS

Compact	Brite Lite™ LED Display, 4-Key Programming Keypad, Industrial rated at 185° F
Full Size	Brite Lite™ LED Display, 32-key Programming Keypad, Industrial rated at 185° F
HDMI Touchscreen (optional)	IP62 NEMA 3, 4 and 4X waterproof and dust tight. Optional sunlight-visible unit. Various sizes. Touchscreen rated at 150° F.

### POWER SUPPLY L3000 PSU (OPTIONAL)

2 Outputs	Each output provides the required +12VDC and +5VDC
2 Inputs	Primary and backup
Input Voltage	6VDC to 34VDC
Primary>Backup	1.2V (to prevent L3000e from running on the backup battery)
+12V Total Amperage	4A
+5V Total Amperage	5A

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