XL GRAPHICAL OCS
LOW-COST COMPACT "ALL-IN-ONE" CONTROLLER

HE-XE102 shown smaller than actual size.

HE-XL100 shown smaller than actual size.

HE-XT102 shown smaller than actual size.

An industry-first! The XL series can store data or easily upload programs via MicroSD™ memory card.

OCS XL Series

1 YEAR WARRANTY   CE   UL

- **More Compact and Affordable than Separate PLC and Operator Interface**
- **Best of Class Graphics Display for Better Process Visualization and Machine Indication**
- **Built-In I/O with Removable Terminal Blocks for Easy Wiring**
- **Removable Mass Data Storage (MicroSD™)**
- **Two Serial Ports and Downloadable Protocol**
- **Ethernet and Telephone Modem Options Cards for Plant and Remote Connectivity**
- **Daylight Readable Touch Screen (XLt, XL6)**

Introducing the XL series Operator Control Station (OCS), an "all-in-one" controller, small enough to fit in the palm of your hand (only 3.75" square). These devices include a Graphical Operator Interface, built-in I/O, networking and removable mass data storage. OCS is a robust, reliable control product that combines a traditional controller (programmed with ladder logic) with an operator interface, I/O and networking into an integrated, all-in-one unit using a single industry-recognized software package called Cscape™.

First with Removable MicroSD™ Memory

The XL is the first industrial product to include support for the latest standard in removable mass storage. This dime-sized memory, to date is only found on video enabled cellular phones and is available in densities ranging from 128 MB to 2 GB. This is ideal for storing process data, machine recipes, and application files. Users can easily update the application program through this memory device—allowing logic and screen updates to be made in a single step with transportable media.

Built-In I/O and Networking

The four available XL models with built-in I/O include digital, analog and high speed I/O. For machine control, the high speed I/O can provide totalizing, frequency measurement, PWM generation and pulse outputs. The available universal analog I/O is ideal for process control applications with high-resolution inputs which can be configured for thermocouple, RTD, 4 to 20 mA, ±100 mV, and 0 to 10V signals. The XL OCS also has field installable communications options. An internal 10/100 MB Ethernet card makes machine data and programming accessible at a plant-wide or world-wide basis. In addition, the XL Series is available with an internal 57.6k telephone modem card. While Ethernet and modem are optional, dual RS232/RS485 serial ports and an integrated CAN-based network are standard.

Applications

As a compact, powerful controller the XL series can be used in literally thousands of applications. From OEM machine control to machine monitoring in a plant environment, the XL series can be instrumental in keeping you or your customer's automation activities running smoothly.

Future expansion is not a concern, because the XL Series is part of the wide ranging OCS product line, programmable throughout with a single FREE software package Cscape. The XL series is designed with an attractive, generic look so it will fit in with most panel or console designs.

Temperature Control

With built-in RTD and thermocouple available, along with auto-tune PID, the XL series can perform advanced temperature control and much more on any machine.

Packaging

The XL series compact size, affordable price and fast response make it a natural for packaging machinery of all types.

Agriculture

A small rugged package, 12 Vdc compatibility, and removable mass storage are ideal for the agricultural environment.

Water Treatment

The XL Series offers the perfect I/O mix, size and communications capability for pump control, tank monitoring and remote telemetry in general.

Connectivity I/O expansion

XL Series I/O expansion is not limited to its built-in I/O. Smartstix I/O is high-speed and can be local or highly distributed.

Architecture

The XL Series supports CsCAN high-speed networking as standard, and Ethernet networking as a field-installable option. Single-point-of-connect allows seamless communication between the computer and any controller.

SPECIFICATIONS

DISPLAY
Graphics/Text: Yes/Yes
Pixels: 128 x 64 (XLe), 160 x 128 (XLt), 320 x 240 (XL6)
Display Technology: Backlit LCD (XLe), daylight readable touchscreen (XLt, XL6)

KEYPAD TOUCH SCREEN
Total Keys: 20 (XLe), 5 (XLt), 6 (XL6)
Function Keys: 10 (XLe), 4 (XLt), 5 (XL6)
Numeric Keys: Shared (XLe), pop-up keypad (XLt, XL6)

CONTROLLER
Ladder Logic Memory: 256 KB
Logic Scan Rate: 1.2 mS/K (XLe, XLt), 0.2 mS/k (XL6)
Memory Card Slot: Yes (up to 2 GB)
Local Comment Storage: Yes
Floating Point Support: Yes
Auto Tune PID capable: Yes

I/O SUPPORT
Built-In I/O: Yes
Smartstix I/O: Yes via CsCAN

UNIVERSAL ANALOG INPUTS (HE-XLE/XLT/XL105)
Input Ranges (Selectable):
0 to 10 Vdc, 0 to 20 mA, 4 to 20 mA, 100 mV, Pt100 RTD and J, K, N, T, E, R, S, B thermocouples
Thermocouple Ranges:
    B/R/S: 0 to 1600°C (32 to 2912°F)
    E: -200 to 900°C (-328 to 1652°F)
    T: -240 to 400°C (-400 to 752°F)
    J: -210 to 750°C (-346 to 1382°F)
    K/N: -240 to 1370°C (-400 to 2498°F)
Nominal Resolution 10V, 20 mA, 100 mV: 14 bits
Nominal Resolution RTD, Thermocouple: 16 bits
Conversion Time per Channel 10V, 20 mA, 100 mV: 16.7 mS
Conversion Time per Channel RTD, Thermocouple: 66.7 mS
Maximum Thermocouple Error (After Warm Up Time of One Hour): ±0.2% (±0.3% below -100°C)

ANALOG INPUTS (HE-XLE/XLT/XL102,103,104)
Range: 0 to 10 Vdc, 0 to 20 mA, 4 to 20 mA, -0.5 to 12V
Resolution: 10 bits
Maximum Error at 25°C: 1% for current ranges, 0.5% for 0 to 10 Vdc range
Conversion Speed: All channels converted once per ladder logic scan
Filtering: 160 Hz hash (noise) filter 1 to 128 scan digital running average filter

DIGITAL DC INPUTS(ALL MODELS)
Input Voltage Range: 12/24 Vdc
Absolute Maximum Voltage: 35 Vdc
Input Impedance: 10 kΩ
Maximum Upper Threshold: 8 Vdc
Minimum Lower Threshold: 3 Vdc
OFF to ON Response: 1 ms
ON to OFF Response: 1 ms
High Speed Counter(HSC) Switching Rate: 10 kHz totalizer/pulse, edges, 5 kHz frequency/pulse, width, 2.5 kHz quadrature

ANALOG OUTPUTS (HE-XLE/XLT/XLT105)
Output Ranges: 0 to 10 Vdc, 0 to 20 mA
Nominal Resolution: 12 bits
Update Rate: Once per PLC scan
Minimum 10V Load: 1 kΩ
Maximum 20 mA Load: 500 Ω
Maximum Error at 25°C (Excluding Zero): 0.1%

RELAY OUTPUTS (HE-XLE/XLT/XL102)
Type: Mechanical contact
Maximum Output Current per Relay: 3 A at 250 Vac, resistive

Maximum Total Output Current: 5 A continuous
Maximum Output Voltage: 275 Vac, 30 Vdc
Maximum Switched Power: 1250 VA, 150 W
Contact Isolation to Ground: 1000 Vac
Maximum Voltage Drop at Rated Current: 0.5V
Expected Life: No load: 5,000,000
Rated Load: 100,000
Maximum Switching Rate: 300 CPM at no load, 20 CPM at rated load
Response Time: One update per ladder scan plus 10 mS

DIGITAL OUTPUTS (HE-XLE/XLT/XL103,104,105)
Output Type: Sourcing/10 K pull-down
Absolute Max Voltage: 28 Vdc maximum
Output Protection: Short circuit
Maximum Output Current per Point: 0.5 A
Maximum Total Current: 4 A continuous
Maximum Output Supply Voltage: 30 Vdc
Minimum Output Supply Voltage: 10 Vdc
OFF to ON Response: 1 mS
ON to OFF Response: 1 mS

SERIAL COMMUNICATIONS
Total Active Ports: 2
RS232 Ports/RS485 Ports: Yes/Yes
PLC/Drive Protocols: Yes
RTU/Modbus Master/Slave: Yes

NETWORKING
Integrated CsCan Network: Yes
Maximum CsCan Distance: 189 m (6000')
Programming Over Network: Yes
Peer-to-Peer Message: Yes
DeviceNet/PROFIBUS Master: No

ETHERNET/INTERNET/WIRELESS
Ethernet Support: Optional
Telephone Modem Support: Optional
Wireless Modem Support: Optional
Cell Modem Support: Optional

GENERAL XLe/XLt:
    Height: 95.1 mm (3.7")
    Width: 95.1 mm (3.7")
    Depth: 63.9 mm (2.5")
    Weight: 0.354 kg (12.5 oz)

GENERAL XL6:
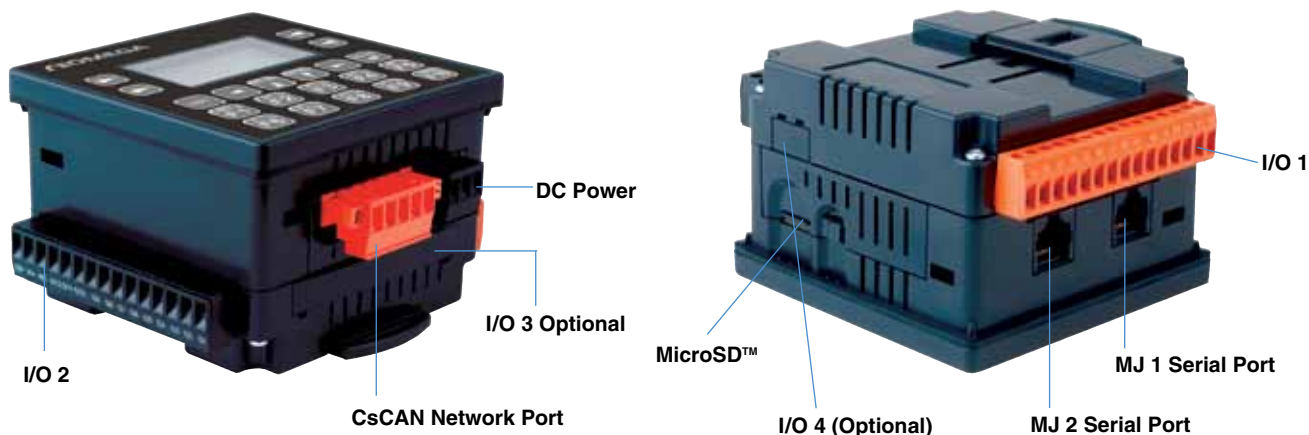   **Height:** 143.6 mm (5.65")
    Width: 186.1 mm (7.33")
    Depth: 88 mm (3.46")
    Weight: 0.751 kg (26.5 oz)
Environmental: 0 to 50°C (32 to 122°F)
Washdown: NEMA 4X (IP66) equivalent

DC Power

I/O 1

I/O 3 Optional

MicroSD™

I/O 2

MJ 1 Serial Port

CsCAN Network Port

I/O 4 (Optional)

MJ 2 Serial Port

XLe Series OCS: All models have a controller, operator interface, networking and I/O built-in. Controller has 256 KB of application memory and 1.2 mS/K logic scan. Operator interface features a 128 x 64 graphical display and 20 key keypad with function key and numeric entry capability.

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MODEL NO.	DESCRIPTION
HE-XE102	XLe Series OCS with DC/relay I/O; 12 digital inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 6 relay outputs – up to 5 A continuous current; 4 10-bit analog inputs selectable between 0 to 10V and 4 to 20 mA
HE-XE103	XLe Series OCS with DC/DC I/O; 12 digital inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz hgh speed counting; 12 DC outputs – 0.5 A per point – 2 outputs can be used as PWM/pulse outputs; 2 10-bit analog inputs selectable between 0 to 10V and 4 to 20 mA
HE-XE104	XLe Series OCS with high-density DC/DC I/O; 24 digital inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 16 DC outputs – 0.5 A per point – 2 outputs can be used as PWM/pulse outputs; 2 10-bit analog inputs selectable between 0 to 10V and 4 to 20 mA
HE-XE105	XLe Series OCS with DC/DC and universal analog I/O; 12 digital inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 12 DC outputs – 0.5 A per point – 2 outputs can be used as PWM/pulse outputs; 2 14-bit universal analog inputs selectable between thermocouple, RTD, 0 to 100 mV, 0 to 10V and 4 to 20 mA; 2 12-bit analog outputs selectable between 0 to 10V and 4 to 20 mA

*Ordering Example: **HE-XE102**, OCS, and **HE-CSP100-4**, software package.*

XLt Series OCS: All models have a controller, operator interface, networking and I/O built-in. Controller has 256 KB of application memory and 1.2 mS/K logic scan. Operator interface features a 160 x 128 sunlight readable graphics display via a high resolution resistive touch screen, 4 function keys and a system key.

MODEL NO.	DESCRIPTION
HE-XT102	XLt Series OCS with DC/relay I/O; 12 digital inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 6 relay outputs – up to 5 A continuous current; 4 10-bit analog inputs selectable between 0 to 10V and 4 to 20 mA
HE-XT103	XLt Series OCS with DC/DC I/O; 12 digital Inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 12 DC outputs – 0.5 A per point – 2 outputs can be used as PWM/pulse outputs; 2 10-bit analog inputs selectable between 0 to 10V and 4 to 20 mA
HE-XT104	XLt Series OCS with high-density DC/DC I/O; 24 digital inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 16 DC outputs – 0.5 A per point – 2 outputs can be used as PWM/pulse outputs; 2 10-bit analog inputs selectable between 0 to 10V and 4 to 20 mA
HE-XT105	XLt Series OCS with DC/DC and universal analog I/O; 12 digital Inputs compatible with 12V/24 Vdc – 4 inputs can be used for 10 kHz high speed counting; 12 DC outputs – 0.5 A per point – 2 outputs can be used as PWM/pulse outputs; 2 14-bit universal analog inputs selectable between thermocouple, RTD, 0 to 100 mV, 0 to 10V and 4 to 20 mA; 2 2-bit analog outputs selectable between 0 to 10V and 4 to 20 mA

*Ordering Example: **HE-XT102**, OCS, and **HE-CSP100-4**, software package.*

HE-XE102 shown smaller than actual size.

XL6 Series OCS: 5.7" TFT color touchscreen with PLC, networking, and I/O. Controller has 256 KB of memory and 0.2 mS/K logic scan. Operator interface features a 320 x 240 sunlight readable graphics display via a high resolution resistive touch screen, 5 function keys and system key.

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MODEL NO.	**DESCRIPTION**
HE-XL100	No local I/O; requires expansion I/O modules
HE-XL102	DC/relay I/O: 12 DC inputs (4 HSC); 6 relay outputs (3A); 4 analog inputs (0 to 10V, 4 to 20 mA, selectable)
HE-XL103	DC/DC I/O: 12 DC inputs (4 HSC); 12 DC outputs (2 PWM/pulse); 2 analog inputs (0 to 10V, 4 to 20 mA, selectable)
HE-XL104	DC/DC I/O: 24 DC inputs (4 HSC); 16 DC outputs (2 PWM/pulse); 2 analog inputs (0 to 10V, 4 to 20 mA, selectable)
HE-XL105	DC/DC and universal analog I/O: 12 DC inputs (4 HSC); 12 DC outputs (2 PWM/pulse); 2 universal analog inputs (RTD, thermocouple, 0 to 100 mV, 0 to 10V, 4 to 20 mA, selectable); 2 analog ouputs (0 to 10V, 4 to 20 mA, selectable)

Ordering Example: HE-XL102, OCS, HE-CSP100-4, software package.

XL SERIES COMMUNICATION OPTIONS

MODEL NO.	DESCRIPTION
HE-XEC	10/100 ethernet option kit, field installable; kit includes all parts necessary for internal installation within the XLe case, including a deeper plastic back cover adapted for Ethernet operation
HE-XMC	57.6k telephone modem option kit, field installable; kit includes all parts necessary for internal installation within the XLe case, including a deeper plastic back cover adapted for modem operation
HE-XRC9	900 MHz RF modem interface

XL SERIES ACCESSORIES

MODEL NO.	DESCRIPTION
HE-CPK	Cscape software package includes; USB memory stick with Cscape software and symbol library with 4000 plus symbols, and OCS programming cable (serial cable and USB adaptor)
HE500CBL300	OCS programming cable, 9-pin female (PC) to RJ-45 (OCS), 1.8 m (6')
HE-XCK	USB programming cable; includes USB to serial adaptor and RS232 cable
HE-MC1	Removable memory card, compatible with XL Series; card capacity is 1 GB
HE-MR1	Memory card reader for HE-MC1; portable device allows HE-MC1 to be plugged into the USB port of personal computers as a portable hard drive