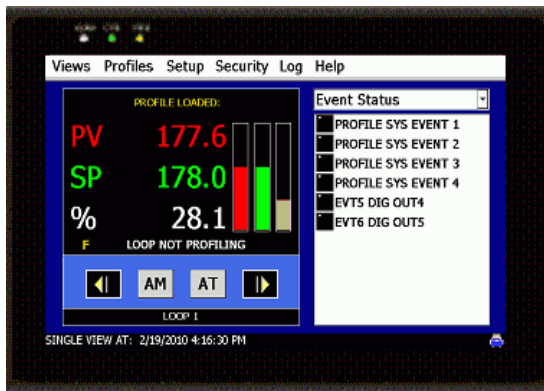


# FDC Orion-M iSeries Control System



**FDC 2107i Windows CE 7" Color Touch**



**FDC 2110i Windows CE 10" Color Touch Screen**

The Orion-M iSeries Control System is an advanced single & multi-loop, monitor point, and logic controller with integrated LAN features that is sized to meet the automation needs of a wide range of process equipment. The Orion-M provides user friendly displays for control systems with one or more of the following needs; operator interface for discreet multi-loop controls, digital IO control logic, data acquisition, profile (ramp/soak), alarm & audit trail file management, multi-level user rights based security, powerful LAN features and more.

The Orion-M iSeries uses separate hardware for the Graphic User Interface (GUI), logic control module and loop controls (multiple loop control vendors supported) providing greater system integrity and installation flexibility. The Orion-M allows up to 15-loop controls, 15-monitor inputs (up to two Monitor cards available as 8-T/C or linear mA/VDC or 6-RTD), 16 digital inputs & 32 digital outputs providing a flexible, low cost easy to use & configure Operator Interface and SCADA control solution.

## Integrated Control Solution

- Process Control (up to 15 loops); Loop controls configurable as single loop, Cascade or Humidity (wet/dry bulb w/humidity derived).
- Loop Controls from multiple vendors are supported; FDC, Honeywell, Watlow, Danaher & others.
- Data Acquisition (paperless recorder) up to 15 loops, 15-monitor points (30 PVs). Monitor Points are a combination of loop control input #2 or Monitor input cards.
- I/O: up to 16 Digital Inputs & 32 Digital Outputs configurable as alarms, events & logic I/O with timer functions
- Profiles (ramp-soak) with up to 99 steps and 32 configurable events (maximum of 32 digital out)
- Alarm Management (email/SMS on alarms)
- Security: multi-level w/user rights

## LAN Features (Ethernet)

- Remote Access via VNC protocol to GUI from PC's, PDA's or other Windows enabled devices
- Email/SMS upon alarm condition
- Email Historical Data, Alarm and Audit Trail files on-demand.
- FTP Historical Data file transfer
- Web Page (view only) with all data shown
- Connect to National Time Server (NTS) to update exact & accurate system time to internal Real Time Clock (RTC)

## Envision PC SCADA Software

- Communicate with up to 128 devices, Orion or FDC loop controls.
- Data log file for each device and/or main data log file with selectable points from all devices.
- Security, Web Serving, email/SMS for alarms and more.

## Graphic User Interface (GUI)

- TFT 7" & 10" Color Touch Screen Windows CE computer with LAN features
- Ease of use with intuitive Windows style Menu Bar and drop down menu system
- Simple access to up to 15 loop controls and 15-monitor points
- View & Print live Trends, Historical Data, Alarm and Operator Audit Trails
- File Transfer via USB, email and FTP

## Flexible Configuration & Use

- User Friendly: Windows style Menu Bar and Menu drop down selection provides intuitive operation
- Easy Configuration Export/Import Utility
- Configurable Home Page (Main View)
- Configurable Historical Data File Viewer, full support of operator events & digital signatures (data encryption)
- Help Menu provides view specific text & voice assistance configurable in multiple languages

The Orion M iSeries is an ideal control solution for boilers, ovens, furnaces, kilns, dryers, environmental chambers, autoclaves, extruders, sterilizers & more.

# Orion-M iSeries Features

## Control Loops:

From simple single loop (maximum 15-loops) to interactive Cascade or Humidity (wet/dry bulb w/derived value) the Orion-M provides the control flexibility for multiple applications. Each Control Loop may be configured to run Profiles (ramp-soak) or as steady state loops (non-profile).

The Orion-M iSeries software must match the type of Control Loop devices used (multiple loop control vendors supported & are ordered separately).

## Monitor only Inputs:

Maximum combination of 2 DIN rail mount 8-T/C, linear ma/VDC & 6-RTD modules that are ordered as components of Orion-Mi - see order matrix (alarms may be assigned to these).

## Data Acquisition:

The Orion-M provides a fully configurable SCADA feature set providing ease of use, data acquisition, alarm manager & operator audit trail; Data Acquisition saved in Historical Data files is described below.

- Data log up to 15 control loops (PV, SP & % out) & up to 2 Monitor Point cards (T/C, mA/VDC or RTD) for a maximum of 30 PVs.
- Data log interval: configurable from 6 seconds to 31 minutes
- Data log File interval: Configurable time interval is from 1 to 31 days.
- Data log File Start / Stop: operator on-demand, digital inputs and configurable to start on system boot or w/ ramp-soak profile start/stop. Once started, a file is configurable to auto end & start a new file with the same name as the previous file with an appended time/date name.
- Data log File name: Allows custom File name, batch & lot values to be entered with all file names (16 character maximum) appended with start time/date. When configured for data log on ramp/soak start the file name is the profile name appended by the start time/date.
- Operator Comments/Events: Unlimited number of operator comments/events linked to each file (16 characters maximum).
- Bar Code Reader input: Optional serial bar code input allowing up to 16-characters inserted into the running Historical Data file as operator events.
- Digital Signatures / Data Encryption: full support for user based digital signatures for each data file and advanced data encryption.
- Data log File Viewing & Printing: View and print data directly from the display or from a PC after data is copied/moved via LAN (FTP or email) or menu driven File Utilities to USB memory card provided.
- View Historical Files on a PC: Orion View Plus PC software provides file decryption and digital signature validation with full featured data viewing, (historical data, alarms, audit trail, & operator events/comments), printing and file export in csv format.

## LAN Features embedded within Orion-M iSeries:

- Remote Access via VNC protocol (password protected); access the GUI on remote PC's, PDA's or other Windows enabled devices. (VNC: Virtual Network Computing protocol)
- Email/SMS on alarm with up to 30 configurable email addresses. Message includes alarm name & time.
- Email on-demand: Historical, Profile, Alarm & Audit Trail files
- FTP embedded client software: Transfer Historical Files to an FTP Server on schedule (2AM every day) or on-demand.
- RTC (real time clock) connection to NTS Time Servers to update the embedded system RTC on a scheduled or on-demand basis. (RTC supports daylight savings time.)
- Web page (view only) showing all PV, SP, Profile, Event, Alarm, DI and DO status.

## Profile (ramp-soak) Management:

The setpoint programmer is configurable to which loop controls are active within the specific profile (maximum of 15-loops).

Flexible features allow powerful Profile management for an unlimited number of profiles with each offering:

- Steps & Events: up to 99 steps w/up to 32 events\*/step
- Step Type: time based or units per hour.
- Guaranteed Soak & Ramp\* (Holdback) referenced as Gar Soak/GS
- Step Advance on time, loop PV, monitor PV or digital input
- Wait For\*: Step advance based upon loop-monitor PV's achieving a specific SP and/or DI inputs and a configurable Delta SP feature.
- Jump to Step\* & Nested Looping
- Profile Start: on-demand, auto-start scheduler or digital input
- Digital Inputs (DI): DI may be configured for profile start, stop, hold, resume, step next/previous step and all outputs off.
- Power Recovery Options; Power Out Time & Action
  - Power Out Time less than that configured: Profile will continue from its previous state
  - Power Out Time greater than that configured: Profile action dependent upon configured recovery state: Off, Hold, Continue, Restart or Resume

\* Step Events, Gar Soak, Jump To & Wait For each have configuration buttons in the Profile create/edit window; they are configurable to be visible or not.

Note: For analog SP retransmission to loop controls without RS485 communications or models not supported by Orion-M refer to manual.

## Single, Dual & All Loop and Monitor Views



## Intuitive Ease of Use - Sample Views

### Menu System Drop Down



### Profile Entry View



### Profile Run View



### Trend or Historical File View; View & Print directly from GUI



# Orion-M iSeries Features

**Alarm Management:** (may be soft or mapped to specific DO)  
Alarms are logged to an Alarm file (new file is created & named by date/time each day there are alarms) with configurable alarm annunciation (Red background on display; yes or no) and operator acknowledge (yes or no).

- Email/SMS on Alarm condition
- System Alarms include communications with call back & more
- Loop controls (up to 15) may have up to 30 Alarms configured. The following alarms configured as soft or mapped to a DO;
  - Process, Deviation, Percent Output and Rate of Change (ROC) each configurable as low, high or both.
- The 8-Monitor Point option may be configured with Process high and/or low alarm points or ROC. (share the 30 alarms w/loop controls)

## Security Features

Multi-level user rights based security; operator, supervisor & administrator levels. Specific access rights can be assigned to each user level as well as configurable password aging & re-authentication for each user.

System allows up to 30 users each with a unique ID, full name and password.

With Security enabled an Operator audit trail may be turned on recording all operator actions. A new file is created each day tracking operator activity with file named by date/time of first daily activity.

## Logic & Sequencing Control:

With up to 16 Digital Inputs (DI) and 32 Digital Outputs (DO) the Orion-M may be configured for a combination of logic & sequencing control functions. DI & DO offer configurable timer functions (time delay for on and off - see sample DO view configuration below).

For maintenance, a counter function provides a message when a digital output's configured count SP has been elapsed; global configuration as interval count, life total count or elapsed run hours

- Digital Inputs (DI) may be configured as (partial listing):
  - Profile ramp-soak function: (Step Hold, Run, Stop, all outputs Off, Advance or Previous Step)
  - Data Acquisition start & stop.
  - Digital Input to defeat specific or multiple DO, activate specific or multiple DO and to defeat other DI.
  - Digital Input as component of logic or sequencing of Digital outputs (DO).
- Digital Outputs (DO) may be configured as (partial listing):
  - Alarms (Loop, Monitor point or DI)
  - Event Outputs for ramp/soak steps
  - Event Outputs for system control (operator controlled)
  - Outputs based upon DI (logic & sequencing)
  - Output include configurable cycle time.

## Configuration

The embedded configuration program and normal runtime allows full customization & configuration of the system directly from the GUI using an intuitive & easy to use Windows style interface with an import/export configuration tool. A partial listing of configuration is shown below.

Control Loops, Monitor Points, Analog & Digital IO

- Configure number of Loop Controls, Monitor Points, Digital and Analog I/O (analog; remote SP input & PV/SP retransmission)
- Loop controls configurable as single loop or interactive; Cascade or Humidity.
- Configurable Tag Names: Loop & Monitor Inputs and Alarms, Events, Digital Input & Digital Outputs.
- Configure Degrees F/C or units, Decimal Point, Setpoint Limits, Alarm type, digital output mapping, LAN settings, Barcode reader, DO counter and more.
- Data Acquisition is a fully configurable SCADA system
- Import/Export complete configuration via USB I-Stick

- Windows style Menu Bar: (allows application specific Menu system)
  - Enable or disable (hide) any of the 5 Menu Bar headings
  - Enable or disable (hide) items in each Menu drop down
- Profile Entry: Enable/disable button for Events, Gar Soak or Waits
- LAN (Ethernet): Remote Access VNC, email setup, FTP client and Real Time Clock date/time, daylight savings & connection to NTS.
- Modbus address for Serial connection from 3rd party vendors
- Alarm Management & Configuration per loop & monitor point
- Security System: Multi-level user rights based system
- Logic & Sequencing Configuration for DI & DO
- Language Selection for Help Text & Voice Assistance

## Red Alarm Annunciation (Red Background) Single Loop Alarm Monitor View



## Alarm History

Alarm Description	Date	Time
FTP Check cable or server down.	1/20/2010	2:01 AM
DIG INPUT 0	1/20/2010	7:29 AM
CONTROLLER #4	1/20/2010	9:55 AM
CONTROLLER #7	1/20/2010	10:30 AM
DIG INPUT 0	1/20/2010	11:13 AM
DIG INPUT 0	1/20/2010	3:31 PM
Comm alm at CM. Check cable.	1/20/2010	10:36 PM

## Security View User Setup Configure Rights

**User Setup**

Add User | Users | User Rights | Security Options

User Group: Administrator

UserID: MLAMBERT

Full Name: MARKLAMBERT

Password: \*\*\*\*\*

Confirm Password: \*\*\*\*\*

Password Aging:

Create User

**Configure Rights**

Add User | Users | User Rights | Security Options

User Group Type: Operator

User Rights:

- Trend Setup
- Email Settings
- Change Setpoints
- Open Files
- Save Files
- Delete Files
- Edit Profiles
- Edit Barcode Capture

Select All | Clear All | Accept

## Configuration Sample Screens

### Digital Input

Screens Setup I/O Help

Select Digital Input # 0

Digital Input Function | User State

- Alarm Input: OFF
- Start Profile: OFF
- Pause Profile: OFF
- Resume Profile: OFF
- Terminate Profile: OFF
- Wait For Event: OFF
- Advance Prev Step: OFF

Input Delay (Secs): 0.0 | Output Default

### Digital Output

Screens Setup I/O Help

Select Digital Output # 0

Digital Output Function | User State

- System Event Output: OFF
- Profile Running: OFF
- Profile Hold: OFF
- Profile Step Change: OFF
- System/Audible Alarm: OFF
- Process Alarm: OFF
- Digital Input Alarm: OFF
- Digi In Not Available: OFF

On Dly (Secs): 0.0 | Off Dly (Secs): 0.0 | Cycle (Secs): 0.0

### Name Event Outputs

Screens Setup Email Help

System Event Names:

PROFILE SYS EVENT 1  
PROFILE SYS EVENT 2  
PROFILE SYS EVENT 3  
PROFILE SYS EVENT 4  
EVT5 DIG OUT4  
EVT6 DIG OUT5

Press each event to change name. Press Accept to Save: Accept

### Language Configuration

Screens Setup I/O Help

Help/Voice Assistance

Select the desired language for text help and voice assisted help.

English | Español | Français

ON | Press to Activate/De-Activate Voice Assist

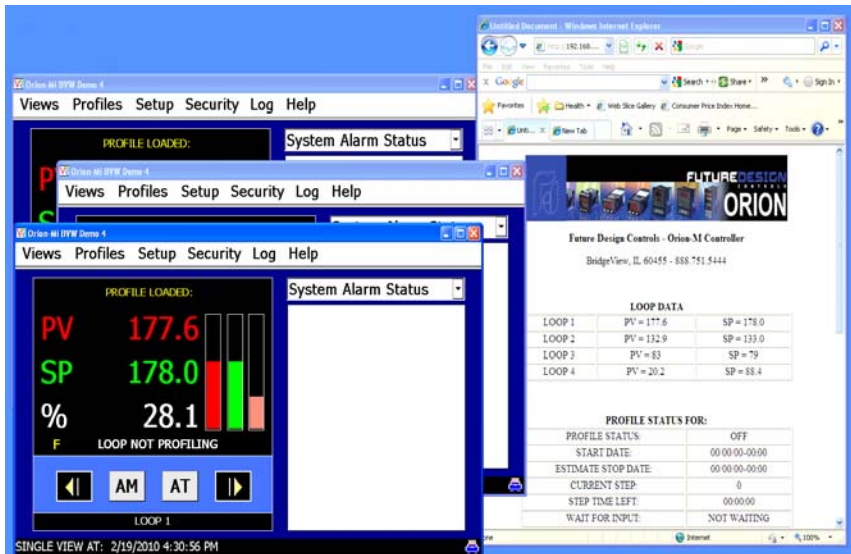
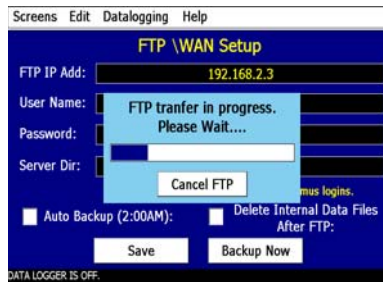
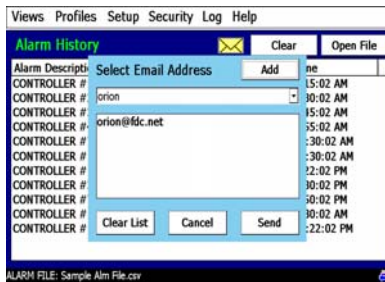
# Orion-M iSeries LAN Features

## Email Setup View

## Email Files on-demand View

## FTP file transfer View

## RTC Setup View



## PC Screen showing Remote Access to Orion's Graphic Users Interface (GUI)

Remote Access via VNC protocol to GUI from PC's, PDA's or other Windows enabled devices allows access via LAN Intranet or Internet.

Open one or multiple Orion-M iSeries control systems from one or more PC's, PDA's, etc.

With appropriate password to access via VNC, full access & control of the GUI is available for training, trouble shooting, remote control and more. Multiple Orion's and one Orion web page shown open at left.

**Envision PC based SCADA software** (no graphic shown) can communicate with up to 128 Orion or other FDC devices. Orion supports serial communication and with 3rd party gateways communicate on DeviceNet, Profibus and other protocols to 3rd party software.

Custom Proprietary OEM versions can be developed from this platform.

## Ordering Information

FDC - Orion - M



1 2 3 4 5 6 7 8 9

Note: Loop Controls are not components of the Orion-M part number

### 1: Graphic User Interface & Control Module: (GUI & CM)

- 0: No Display (GUI) - Control Module Only
- 2: FDC-2107i Windows CE 7" iSeries Color Touch
- 3 FDC-2110i Windows CE 10" iSeries Color Touch

GUI (display) has Ethernet, 2 USB and 2 Serial ports. Control Module (CM) includes the following:  
 FC5A CPU with on-board 8-digital inputs (24VDC) and 8-digital outputs (6-relay/2TTL), Memory Card, RTC, Modbus port, Reset Timer & socket, 2GB SD Memory Card (holds the Orion-M application software), 2GB High Capacity USB Memory Stick PS5R-SD24 Power Supply (Input 85-264VAC/Output 24VDC 60 Watt (2.5 amp))

### 2: Graphic User Interface (GUI) Application Software

- 0: None: Control Module only
- 2: FDCi: Standard iSeries software for 7" and 10" displays
- 3: FDSR: SR iSeries software for 7" and 10" displays

### 3: Control Module (CM) Application Software (loop control type)

- 0: None: CM software without support for loop controls
- 1: FD10: CM software for FDC 100 Series
- 2: FD30: CM software for FDC 300 Series (note 2)
- 3: HWSL: CM software for Honeywell 2500/3200 (note 2)
- 4: HWDL: CM software for Honeywell 3500 (note 3)
- 5: WTSD: CM software for Watlow SD
- 6: WTPM: CM software for Watlow PM
- 7: DHPL: CM software for Danaher West/Partlow Plus
- 8: YKGS: CM Software for Yokogawa UT Green Series Software Future Release

### 4: Monitor Inputs (note 2) (all modules isolated) (DIN Rail Mount; serial connection to CM)

- 0: None
- 1: IO-8TCS
- 2: IO-6RTD
- 3: IO-8AHS
- 4: IO-8AIVS
- A: Item 1 / qty 2
- B: Item 2 / qty 2
- C: Item 3 / qty 2
- D: Item 4 / qty 2
- E: Items 1 & 2
- F: Items 1 & 3
- G: Items 1 & 4
- H: Items 2 & 3
- I: Items 2 & 4
- J: Items 3 & 4

### 5: Digital Inputs (note 1) (addition to 8 DI on CM) (DIN Rail Mount; plug into CM)

- 0: None
- 1: FC4A-N08B1: (8-digital input (24 VDC))
- 2: FC4A-N08A11: (8-digital input (120VAC))

### 6: Digital Outputs (note 1) (addition to 8DO on CM) (DIN Rail Mount; plug into CM)

- 0: None
- 1: FC4A-T08S1 (8-digital output 24VDC (source))
- 2: FC4A-R081 (8-digital output (240VAC 2-amps))
- 3: FC4A-T16S3 (16-digital output (24 VDC (source))
- 4: FC4A-R161 (16-digital output (240VAC 2-amps))

For combinations of optional DO modules (max 32) refer to the Orion-M Price or Matrix bulletins for order codes.

### 7. Analog I/O (note 1) (DIN Rail Mount; plugs into CM) Each Analog I/O has 2 Remote Setpoint input & one Retransmission configurable for PV, SP or % Output.

- 0: None
- 1: 1 A-IO card FC4A-L03A1 (4-20mA or 0-10VDC IO)
- 2: 2 A-IO cards FC4A-L03A1 (4-20mA or 0-10VDC IO)
- 3: 3 A-IO cards FC4A-L03A1 (4-20mA or 0-10VDC IO)
- 4: 4 A-IO cards FC4A-L03A1 (4-20mA or 0-10VDC IO)
- 5: 5 A-IO cards FC4A-L03A1 (4-20mA or 0-10VDC IO)
- 6: 6 A-IO cards FC4A-L03A1 (4-20mA or 0-10VDC IO)
- 7: 7 A-IO cards FC4A-L03A1 (4-20mA or 0-10VDC IO)

### 8: Serial Communications (note 1) (DIN Rail Mount; plugs into CM)

- 0: None
- 1: FC5A-SIF4: (RS485 Modbus RTU port (slave)
- 2: FC5A-SIF2: (RS232 port for Barcode Reader)

Note: If Item 2 is specified Item 1 is supplied & counted in the total number of modules.

### 9: Special

- 0: None
  - 1: CM Assembled & wired on DIN Rail
- Note: CM Assembled includes wired power supply, power on delay timer, CPU & optional I/O; schematic included

Future Design Controls, Inc.  
 P.O. Box 1196 / Bridgeview, IL 60455  
 888-751-5444 / technical support 866-332-3255  
<http://www.futuredesigncontrols.com>  
[csr@futuredesigncontrols.com](mailto:csr@futuredesigncontrols.com)

**Note 1:** CM will support up to 7 expansion modules. The Monitor Point input module is not a CM module.  
**Note 2:** Maximum of 2 Monitor Input cards monitoring a maximum of 15 monitor card inputs. Specific CM software allows the loop control's input #2 to be configured as monitor points. System maximum of 15 monitor points from loop control #2 input, monitor cards or combination.  
**Note 3:** Dual loop HW3500 is limited to 7 controls maximum (14 loops) compared to 15 for other single loop models.