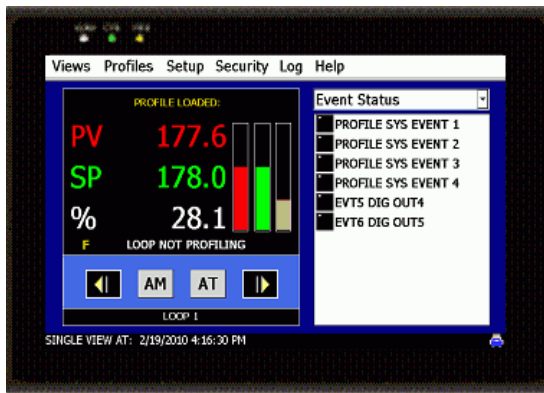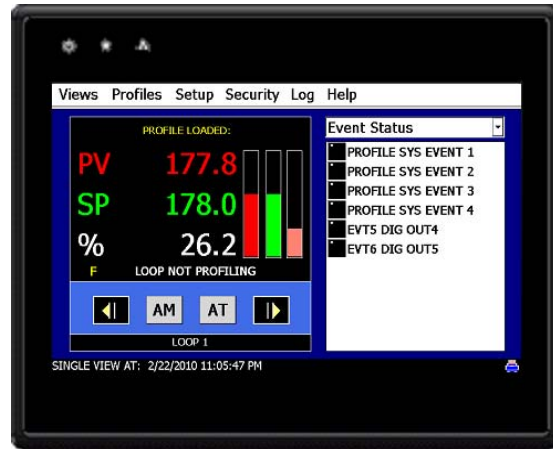![FUTURE DESIGN CONTROLS logo]

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, monitor inputs (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 & 8-monitor points (23 PVs); w/specific dual input loop controls up to 30 PVs.
- 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)

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 8-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 iSeris 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:

DIN rail mount 8-T/C or linear ma/VDC or 6-RTD module that is ordered as a component of Orion-M (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) & 8-Monitor Points (T/C, mA/VDC or RTD) a maximum of 23 PVs. When used with specific dual input loop controls up to 30 PV values may be logged.
- 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 or to activate specific or multiple DO.
  - 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.
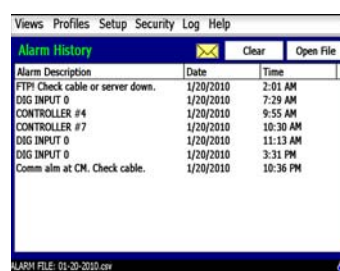
Configuration

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)
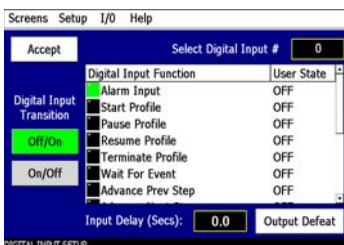
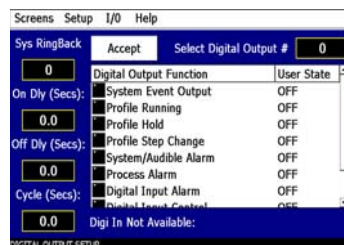**Single Loop**   **Alarm Monitor View**

Security View

User Setup   **Configure Rights**
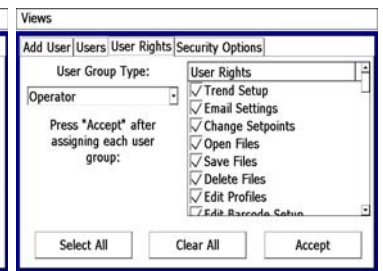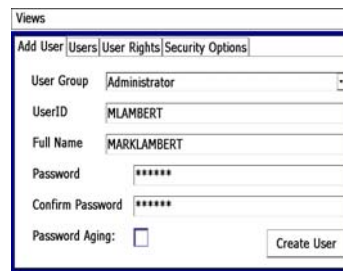
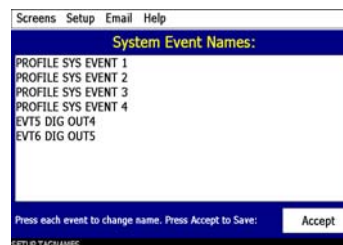## Configuration Sample Screens

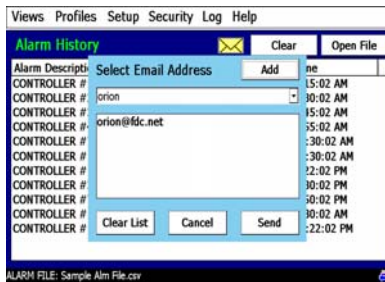**Digital Input**   **Digital Output**   **Name Event Outputs**   **Language Configuration**

Orion-M iSeries LAN Features
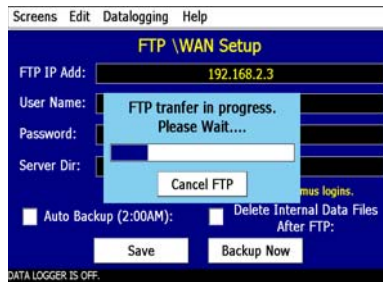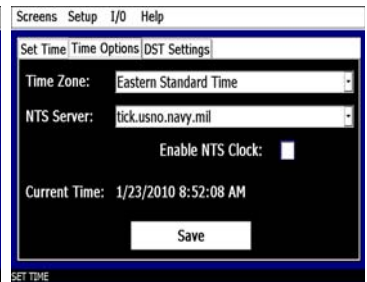
Email Setup View	Email Files on-demand View	FTP file transfer View	RTC Setup View
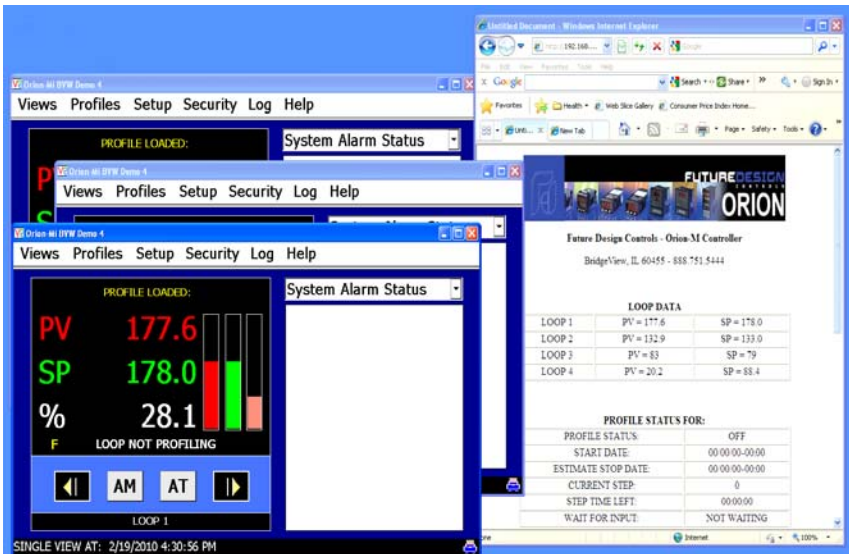
PC Screen showing Remote Access to Orion's Graphic Users Interface (GUI)

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.

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

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

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

2: FDCi: standard iSeries software for 7" and 10" displays
3: Future Release

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

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
9: XXXX: Future Release
Software Future Release

YKXX; CM Software for Yokogawa UT Advanced
ERXX: CM software for Eurotherm loop controls

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

0: None
1: IO-8TCS: (8-thermocouple input module)
2: IO-6RTD: (6-RTD input module)
3: IO-8AIIS: (8- input module 0-20 / 4-20mA)
4: IO-8AIVS: (8-analog: 0-10 / 2-10VDC)

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.

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

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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

Note 1: CM will support up to 7 expansion modules. The Monitor Point input module is not a CM module.
Note 2: When CM Application Software FD30 or HWSL is specified and system configured to monitor input #2, matrix code #4 (Monitor Points) must be None.
Note 3: Dual loop HW3500 is limited to 7 controls maximum (14 loops) compared to 15 for other single loop models.