FDC Orion-M Control System

The Orion-M Control System is an advanced single & multi-loop, monitor point, and logic controller with integrated LAN features. The Orion-M offers data acquisition, recipe (ramp/soak), alarm, audit trail file management, multi-level user rights based security, powerful LAN features and more. Orion-M's modular design and standard features meets the automation needs of a wide range of process equipment.

The Orion-M uses separate hardware for the Graphic User Interface (GUI), logic control module and loop controls providing greater system integrity and installation flexibility. The Orion-M allows up to 15-loop controls, 8-monitor inputs (t/c, RTD or linear mA/VDC), 16 digital inputs & 24 digital outputs providing a flexible, low cost easy to use Operator Interface and SCADA control solution.

Integrated Control Solution

- Process Control (up to 15 loops); Typical single loop, Cascade or Humidity (wet/dry bulb)
- Data Acquisition (paperless recorder) up to 15 loops & 8-monitor points
- I/O: up to 16 Digital Inputs & 24 Digital Outputs configurable as alarms, events & logic I/O with timer functions
- Ramp-Soak Recipes with up to 99 segments and 24 configurable events
- Alarm Management (email/SMS on alarms)
- Logic & Sequence Control
- Security: multi-level with 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 5.6" 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

- Windows style Menu Bar and Menu drop down selection provides intuitive operation
- Configurable Home Page (Main View)
- Configurable Data Acquisition History Viewer, full support of operator events, digital signatures & advanced encryption
- Help Menu bar provides screen view specific text & voice assistance configurable in multiple languages

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

Orion-M Features

Control Loops:
From simple single loop (maximum 15-loops) to interactive Cascade or Humidity (wet/dry bulb) the Orion-M provides the control flexibility for multiple applications. Each Control Loop may be configured to run Ramp-Soak Recipes or as steady state loops (non-profile).

The Orion-M firmware must match the type of Control Loop devices used. (Control loop devices are ordered separately.)

Monitor only Inputs:
DIN rail mount 8-channel isolated t/c, RTD or mA/VDC module (with configurable alarms) that is ordered as a component of Orion-M.

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 input)
- Data log interval: configurable from 6 seconds to 31 minutes
- Data log File Start / Stop: by operator on-demand, digital inputs and configurable to start on system boot or with ramp-soak recipe start/stop.
- Data log File interval: Once started a data log file is configurable to auto end & start a new file with the same name as previous file with an appended time/date name. Configurable time interval is from 1 to 31 days.
- Data log File name: Allows custom File name, batch & lot values to be entered with all file names appended with start time/date. When configured for data log on ramp/soak start, the file name includes the recipe name running.
- Data Encryption: Advanced Data Encryption is standard
- Operator Comments/Events: Unlimited operator comments/events linked to each file.
- Digital Signatures: full support for user based digital signatures for each data file.
- 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 USB flash 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:
- 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, Alarm & operator 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, Recipe, Event, Alarm, DI and DO status.

**Ramp-Soak Recipe Management:**
The setpoint programmer is configurable to which loop controls are active within the specific recipe (maximum of 15-loops).

Flexible features allow powerful Recipe management for an unlimited number of recipes with each offering:
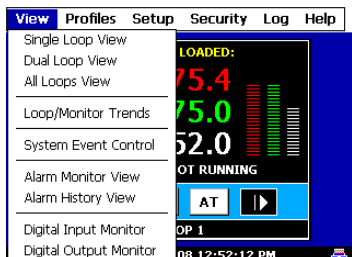
- Segments & Events: up to 99 segments & 24 events
- Ramp Type: time based or units per minute or hour.
- Guaranteed Soak & Ramp (Holdback)
- Jump to Segment & nested looping
- Recipe Start: on-demand, auto-start scheduler or digital input
- Segment Advance on time, loop PV, monitor PV or digital input
- Digital Input (DI): DI may be configured for recipe start, stop, hold, resume, segment next & previous 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

Note: Remote Analog Setpoint input from 3rd party setpoint programmer(s) are configurable by loop, as is Retransmission of selected PV's, SP's or recipe ramp-soak setpoint value. Each Analog card accepts 2 linear remote SP signals and offers one linear retransmission with a maximum of 5 Analog cards.

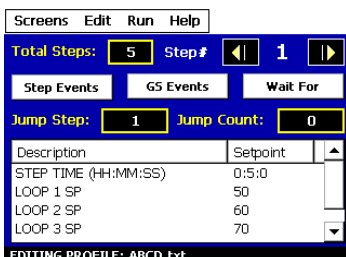## Single, Dual & All Loop and Monitor Views
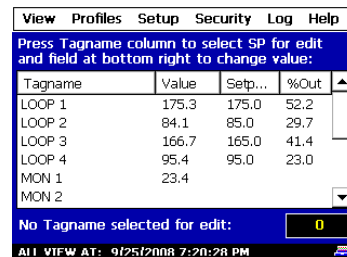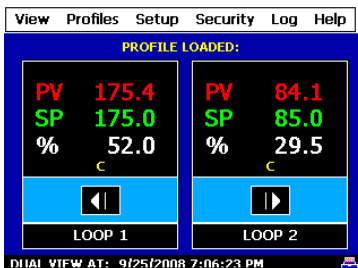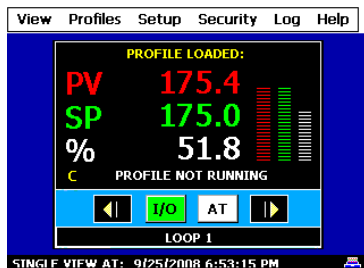
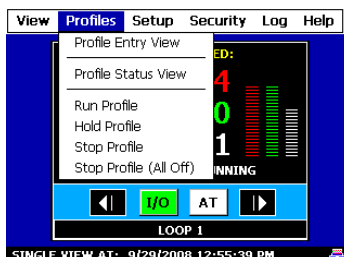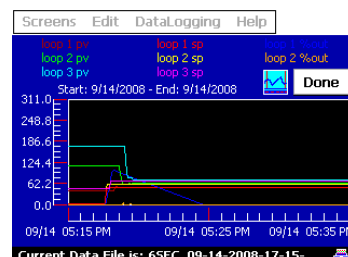### Intuitive Ease of Use - Sample Views

Menu System Drop Down **Profile Entry View** **Profile Run View** **Trend or Historical File View View and Print directly from GUI**

Orion-M 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 low and/or high, Deviation low, high or ban Percent Out high or low or Rate of Change (ROC)
- The 8-monitor input 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 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 24 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 is included providing a message when a configured number of sequences (DI & DO) have occurred.

- Digital Inputs (DI) may be configured as (partial listing):
  - Recipe ramp-soak function: (Segment Hold, Run, Stop, all outputs Off, Advance or Previous Segment)
  - 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 segments
  - Event Outputs for system control (operator controlled)
  - Outputs based upon DI (logic & sequencing)
  - Output include configurable cycle time.
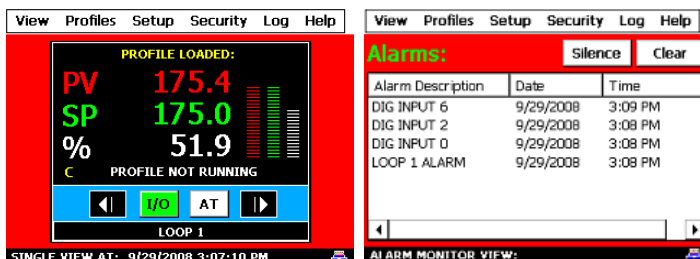- Bar Code Scanner input (available 3rd quarter 2009)

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. 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, Humidity or Carbon Potential.
- 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 and digital output mapping.
- Data Acquisition is a fully configurable SCADA system

- 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
- 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 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 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.
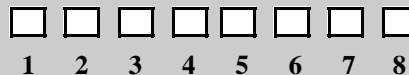
Multiple Orion's and one Orion web page shown open at left.
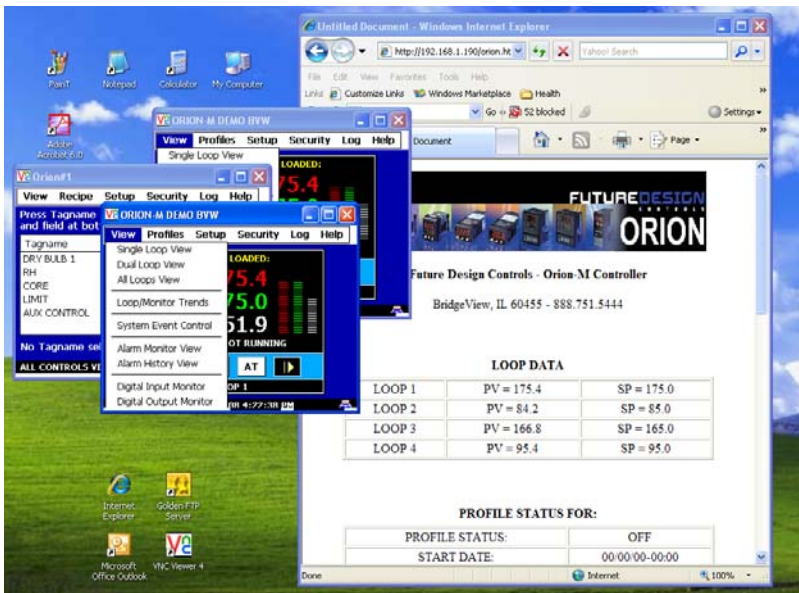
Custom Proprietary OEM versions can be developed from this platform.

Ordering Information

FDC - 2010 - M ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
           1   2   3   4   5   6   7   8

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

1: Graphic User Interface (GUI):
(Panel Mount Color Touch Screen)

1: FDC-2010 Windows CE 5.7" Color Touch

Ethernet, 2 USB and 2 Serial ports. Includes FC5A CPU with on-board 8-digital inputs (24VDC) and 8-digital outputs (6-relay/2TTL), Memory Card, RTC, Modbus port, Reset Timer & socket, 1GB I-Stick and CPU to Display 6ft cable,
PS5R-SD24 (Input 85-264VAC/Output 24VDC 60 Watt (2.5 amp))

2. Application Software
(Application firmware provided on 1GB CF) card

FDC3: Orion-FDC300 Series firmware
HW25: Orion-HW2500 Series firmware (Honeywell)
HW32: Orion-HW3200 Series firmware (Honeywell)
TBD:
TBD:
TBD:
TBD:
TBD:
TBD:

3: Digital Inputs
(DIN Rail Mount; plugs into CPU)

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

4: Digital Outputs
(DIN Rail Mount; plugs into CPU)

- **0: None**
- **1: FC4A-T16S3** (16-digital output (24 VDC)
- **2: FC4A-R161** (16-digital output (240VAC 2A)
- **9: Special**

5: Monitor Inputs (all modules isolated)
(DIN Rail Mount; serial connection to PC)

- **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-8AIIVS:** (8-analog: 0-5/1-5/0-10/2-10VDC)
- **9: Special**

6: Serial Communications
(DIN Rail Mount; plugs into CPU)

- **0: None**
- **1: FC5A-SIF2:** (RS232 port for Barcode Reader) *
- **2: FC5A-SIF4:** (RS485 Modbus RTU port (slave))
- **3: Both FC5A-SIF2 and FC5A-SIF4 cards**
- **9: Special**

*Bar Code Scanner input for compatible Code 39 barcode reader wand, such as HP HBSW-8300. Configurable to:
- Historical Data File name is inserted and/or file started
- Start loaded Profile
(System configurable upon profile start a Historical Date file is created with the profile name or file name from the bar code reader).

7. Analog I/O (DIN Rail Mount; plugs into CPU)
Each Analog I/O has 2 Remote Setpoint input a Re-transmission configurable for PV, SP or % Output. All modules offer 4-20mA or 0-10VDC.

- **0: None**
- **1: One AI card FC4A-L03A1**
- **2: Two AI cards FC4A-L03A1**
- **3: Three AI cards FC4A-L03A1**
- **4: Four AI cards FC4A-L03A1**
- **5: Five AI cards FC4A-L03A1**
- **9: Special**

8: Expansion Module
(DIN Rail Mount; plug into CPU)

- **0: None**
- **1: FC5A-EXM2**

Note: expansion module is required when more than 7 cards of digital Inputs, digital outputs, serial communication or Analog I/O are specified.

The expansion module will support 7 additional cards The Monitor Input modules are not counted as one of 7 cards.