

FDC Orion-M iSeries Control System

Part Number Matrix - February 2011



FDC-2107i Windows CE 7" Color Touch Screen



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 iSeries provides user friendly displays for control systems with one or more of the following needs: operator interface for discreet single or 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.

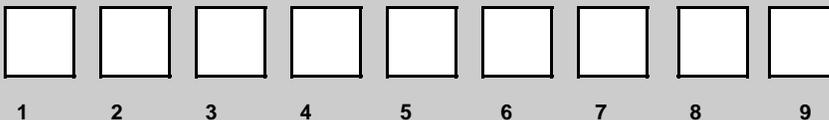
The Orion-M iSeries uses separate hardware for the Graphic User Interface (GUI), available in 7" and 10", logic control module (CM) and individual loop controls (multiple loop control vendors supported) providing greater system integrity and installation flexibility. The Orion-M iSeries allows up to 15-loop controls, up to 15 monitor inputs (up to two Monitor Cards available as 8 input t/c, linear mA/VDC or 6 input RTD cards), 16 digital inputs & 32 digital outputs. When used with specific dual input loop controls up to 30 PV values may be monitored; see order matrix.

The digital IO configuration is menu driven for a variety of functions including system events, alarms (system, loop & monitor input), profile & data log start/stop, step advance & other functions for data logging and profiles and specific DI to DO functions with all having time delay and cycle timers (DO).

The Orion-M iSeries has an embedded configuration program with other settings available from the normal runtime. All configuration settings are done on the touch screen without external PC or other equipment necessary. Easy to configure coupled with an import/export utility allows for easy & accurate configuration for OEMs, System Integrators and users alike.

The Orion-M iSeries provides a flexible, low cost easy to use Operator Interface and SCADA control solution.

FDC Orion-M -



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

0: No Display (GUI) - Control Module only

notes: - a display is required for system configuration
 - no display (headless) system typically used with EnVision PC based SCADA or other 3rd party software
 - Matrix code 8 Serial Communication requires code 1 or 2. For the Orion to communicate with PC based software.

- 2: FDC-2107i Windows CE 7" iSeries Color Touch Screen**
- 3: FDC-2110i Windows CE 10" iSeries Color Touch Screen**

Control Module (CM) includes the following components:

FC5A-D16RS1: Control Module CPU with on-board
 8-digital input (24VDC) and 8-digital outputs (6-relay/2TTL)
 FC4A-PM64: 64KB Memory Card
 FC4A-PT1: Real Time Clock
 FC4A-HPC3: RS485 Modbus port (connect loop controls & Monitor point cards to CM)
 CA2011-8A: Cable from CM to GUI display (8ft)
 GE1A-C10MA110 / SR2P-06: Reset Timer and socket (DIN Rail)
 2GB SD Memory Card (holds Orion-Mi application software),
 2GB High Capacity USB Memory Stick (3VDC),
 PS5R-SD24 Power Supply (Input 85-264VAC/Output 24VDC 60 Watt (2.5 amp))

2. Graphic User Interface (GUI) Application Software

- 0: None:** No GUI (matrix code 1 is 0 for no display)
- 2: FDCi:** Standard GUI software for 7" and 10" display
- 3: FDSR:** SR iSeries software for 7" and 10" displays

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 (note 2)
- 7: DHPL:** CM software for Danaher West/Partlow Plus
- 8: YKGS:** CM software for Yokogawa UT Green Series
- 9: FDSR:** CM software for FDC 300 Series Orion-M SR

Software - Future Release

YKXX: CM software for Yokogawa UT Advanced
 ER20: CM software for Eurotherm 2000 Series
 ER20: CM software for Eurotherm 3000 Series
 ERM8: CM software for Eurotherm Mini 8 Series

4. Monitor Inputs (Note 2) (DIN Rail Mount - serial connection to CM)

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

Combination Monitor Input modules (maximum of 2 & 15 points)

- A: Item 1 / qty 2:** **F: Items 1 & 3:**
- B: Item 2 / qty 2:** **G: Items 1 & 4:**
- C: Item 3 / qty 2:** **H: Items 2 & 3:**
- D: Item 4 / qty 2:** **I: Items 2 & 4:**
- E: Items 1 & 2:** **J: Items 3 & 4:**

Note 1: CM will support up to 7 expansion Modules (the Monitor Point input modules are not a CM expansion module).

Note 2: Maximum of 2 Monitor Input cards monitoring a maximum of 15 monitor card inputs. With specific CM software the loop control's input #2 may be configured as monitor points. System maximum of 15 monitor points made up of loop control input #2, inputs to Monitor Input cards or combination of both.

Note 3: Dual Loop HW3500 is limited to 7 controls maximum (14 loops)

5. Digital Inputs (note 1) (DIN Rail Mount - plug into CM)

0: None

- 1: FC4A-N08B1:** (8-digital input card (24VDC))
- 2: FC4A-N08A11:** (8-digital input card (120VAC))

Note: The above optional digital inputs (DI) are in addition to the 8 24VDC DI that are standard on the CM; system maximum of 16 DI

6. Digital Outputs (note 1) (DIN Rail Mount - plug into CM)

0: None

- 1: FC4A-T08S1** (8-digital output- TTL 24VDC (source)) *
- 2: FC4A-R081** (8-digital output - Relay (240VAC 2-amps))
- 3: FC4A-T16S3** (16-digital output- TTL 24VDC (source)) *
- 4: FC4A-R161** (16-digital output - Relay (240VAC 2-amps))

Combination DO modules (maximum of 24 optional DO)

- A: Item 1 / qty 2** **G: Items 1 & 3**
- B: Item 1 / qty 3** **H: Items 1 & 4**
- C: Item 2 / qty 2** **J : Items 2 & 3**
- D: Item 2 / qty 3** **K : Items 2 & 4**
- E: Item 1 qty 2 & Item 2 qty 1**
- F: Item 1 qty 1 & Item 2 qty 2**

*The terminal blocks for all of the above are inclusive except for the FC4A-T16S3 24VDC output card whose terminal block is a separate component, part number FC4A-PMPC20P. This terminal block is included as a separate component when specifying this output card.

Note: The above optional digital outputs (DO) are in addition to the 8 DO that are standard on the CM (6 relay & 2 TTL 24VDC); system maximum of 32 DO standard on the CPU; system maximum of 16 DI

7. Analog I/O (note 1) (DIN Rail Mount - plug into CM)

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)

Note: each I/O card has qty 2 Remote Setpoint input and qty 1 Retransmission output configurable for PV,SP or %Out

8. Serial Communication (note 1) (DIN Rail Mount - plug into CM)

0: None

- 1: FC5A-SIF4:** (RS485 Modbus RTU port (slave))* (port 3)
- 2: FC5A-SIF2:** (RS232 port for Barcode Reader) **

Note: If Item 2 is specified Item 1 must be included and counted in the total number of modules

* RS485 Modbus RTU port allows R/W by FDC EnVision & 3rd party software.

**Bar Code Reader input is compatible for serial based barcode readers. System will accept up to 16 characters of data from the bar code scanner. Data from the bar code reader will be inserted as operator events in the Historical Data File; there is no limit to the number of events that may be entered manually or with a bar code scanner.

9. Special

0: None

- 1: CM Assembled & wired on DIN Rail**

Sample Part Number:

FDC Orion-M-2-2-2-1-1-4-0-0-0

GUI 7" display, FDCI (standard Orion-M iSeries) software, CM firmware for FDC 300 Series loop controls, Monitor input card (8-t/c inputs), 8 additional DI, 16 additional DO, no Analog I/O, no Serial communication and no Special functions

FDC - ORION-M iSeries Product Notes & Options

NOTES: SCADA (Supervisory Control & Data Acquisition)

FDC-Orion-M iSeries Graphic User Interface (GUI) is available in 7" and 10" color touch screens. The GUI provides a full SCADA feature set providing ease of use, data acquisition, alarm manager, operator audit trail, multi-level Security with user rights, LAN connections and more.

Note: Systems with no display (headless) do not offer data logging. PC based SCADA software, like FDC's EnVision or other 3rd party software can provide device level (Orion) or system (multiple devices) data file capability.

The GUI provides ease of configuration, use & support

- System Configuration for loop, monitor point, alarm, digital input & outputs assignment / logic, Help language selection and more, all without an external device or PC.
- Loop Views: multiple view Loop and/or Monitor Points in single or All View; Trend, Bar Graph and Digital views also available
- Profile : Virtually unlimited number of profiles with each profile having up to 99 steps with up to 32 events.
- File Management: View, print, copy/move Profile, Alarm, Historical Data (data log files) and operator audit trial files. File transfer via LAN features or USB flash memory.
- Support: View loop & digital IO status, force loop & digital outputs and more.
- Print: Print directly from GUI via USB port
- LAN: Remote Access & touch screen operation (VNC), email/SMS on alarm, email historical, alarm & audit trail files on-demand, Web Page (view only) and FTP of historical data files automatically or on-demand.

Data Acquisition:

- Data log up to 15 loops (PV, SP & % out) & 30 Monitor Points. 2 Monitor cards of 15 total points with specific loop controls may use their 2nd input as Monitor Points; system max of 30.
- Log interval: configurable 6 seconds to 31 minutes with configurable number of days to auto start & name next file (1 to 31 days).
- File Start/Stop: Configurable; operator on-demand, on system boot, profile ramp-soak start/end or digital inputs
- File Interval: Once started a data log file is configurable to auto end and start new file with the same name as previous file with an appended time/date name. Configurable time interval is from 1 to 31 days.
- File name: Operator entered file name, batch & lot number or if running a profile, file name is the same as profile name. (all file names appended with date-time to file name)
- Operator Comments/Events: Unlimited operator comments/events linked to each file entered manually or via Bar Code Scanner.
- Digital Signatures: full support of user based digital signatures for each data file (data encryption).
- Historical Data File: View & print the data directly from the display (auto scale on x & y axis with each channel selectable for right or left axis values), from a PC after data is copied/moved via LAN (FTP or email) or USB Flash Memory card provided (via File Utilities menu).

NOTES: Monitor Inputs - Optional

Monitor Inputs:

The FDC-IO modules are DIN rail mount 8-channel isolated thermocouple, RTD (6-channel) or 8-channel linear mA or VDC input modules. Each monitor point is configurable for Alarm setpoints and segment advance "wait for" logic (SP logic & Loop Delta function).

2 Monitor Input cards may be specified. Orion system configuration allows up to 15 Monitor points plus input #2 of specific loop controls

Information on the FDC-IO modules may be found at the link.
http://www.futuredesigncontrols.com/FDC-IO_Modules.html

NOTES: Power Supply -Standard (DIN Rail Mount)

Power Supply:

DIN Rail mount 24VDC 60 watt power supply (2.5-amps) to power the FDC-2010 GUI, control module CPU, optional IO and FDC-IO temperature input modules.

NOTES: Configurable Control Logic

Ramp Soak Profiles (Global Profile configurable as Time or Ramp Rate based): The FDC-Orion-M iSeries provides a virtually unlimited number of profiles each with up to 99 steps with up to 32 configurable events per step. Step Advance, Hold, Stop, and "Wait For" logic per step is standard. The "Wait For" step advance logic includes digital inputs, loop / monitor points achieving a "wait for SP" and Delta SP logic.

Configurable Loop Control:

Each of the DIN Control loops may be configured via the operator interface as single loop controls or as components in Cascade or RH % values. Each control loop is configurable to run Ramp Soak profile or as steady state controls (non-profile) per profile file.

Alarm Configuration:

System Alarms

System Alarms include loss of communication with loop & monitor points, configurable call back, audible and more; may be mapped to one of the standard or optional digital outputs

DIN Control Loop Alarms (maximum of 30 alarms total for Loop & Monitor)

The loop controls (up to 15) may have up to 30 alarms configured per loop. The alarms may be configured as soft/audible, latching or not, inhibit logic and to defeat any digital output. Alarms may be mapped to one or more of the standard or optional digital outputs (maximum of 32 digital outputs). Alarm types include:

- Process, Deviation, Percent Output and Rate of Change (ROC) low, high or both

Monitor Input (maximum of 30 alarms total for Loop & monitor)

Each channel may be configured with Process or Rate of Change (ROC) High and/or Low, soft/audible, latching or not, inhibit and/or to defeat any digital output. Alarms may be mapped to one or more of the standard or optional digital outputs (max of 32 digital output)

Digital IO Configuration

Digital Outputs (DO): CPU includes 8-digital output (6-relay & 2-TTL) with optional 8 & 16 output cards (24VDC or relay); max of 32 DO.

DO are configurable as:

- Loop, monitor point or digital input alarms
- Event outputs used in ramp soak profiles
- Event output for profile status: run, hold & step change
- Event outputs as a result of Digital Inputs
- Configurable cycle times to pulse an output or no cycle - on 100%
- Configurable time delay to automatically turn DO off
- Configure DO with counter & alarm message

Digital Inputs (DI): CPU includes 8-digital inputs with optional 8-digital input card for maximum of 16 digital inputs.

DI may be configured:

- Configurable time delay (timers)
- System Run
- Alarm Input
- Data Acquisition start and stop
- Profile functions; start, stop (all off), hold, advance, previous or next step.
- Defeat Logic; disable specific or groups of DO and DI
- Disable Communication to loop controls SP or All components
 - SP communication disabled: SP values may be changed at loop controls while still monitor & data log all values.
 - All communication disabled: SP values may be changed at loop controls but no loop, monitor alarms or data log occurs.

NOTES: Analog I/O - Optional (DIN Rail Mount; plugs into CM)

Analog I/O (Input/Output):

Remote Setpoint: Cards accept two 4-20mA or 0-10VDC inputs to be transmitted as SP values via the serial link to specific DIN controllers.

Retransmission: Cards have one 4-20mA or 0-10VDC signals configurable as PV, Setpoint or % Out values from specific DIN controls

Maximum number of cards is 7: 14 remote setpoint inputs and 7 retransmitted PV, Setpoint or %Output values.

FDC - ORION-M iSeries Product Options and Spare Parts

NOTES: System Configuration

Orion-M iSeries has an embedded configuration program and normal runtime allowing full customization & configuration directly from the GUI. Simple Import/Export function allows complete configurations to quickly & easily imported to other Orion-M iSeries control systems.

Configuration Program allows:

- Number of Loop Controls, Monitor Points, Digital Inputs, Digital Outputs and Analog I/O.
- Assign Tag Names to Loop, Monitor, Alarms, System Events, Digital Input & Outputs
- Profile Setup: Time or Ramp Rate based Ramp configuration.
- Main View: Select Start up/Main View (home page)
- Menu System: Enable/disable specific Menu items & functions not required or desired for the application
- System Event Configuration to allow multiple DO from one Event

Runtime Configuration allows:

Profile Power Recovery logic, Setpoint Limits, Alarm Settings, LAN settings (VNC, Modbus, web server, email, FTP, alarm email / text), Barcode Reader, degrees C/F, DO counter, Date/Time, Help/Voice language selection, I/O mapping & logic, Monitor Point offset, Analog I/O configuration, export/import configuration & more

NOTES: Loop Controls (Serial connection to CM)

Control Module (CM) Software for Loop Controls:

The software allows connection up to 15 loop controls and up to two FDC-IO analog input modules (8-T/C, 6-RTD or 8-mA or VDC inputs) for a maximum of 15 Monitor Points or a maximum of 30 PV inputs.

The software and appropriate loop control model is identified by the character description on the part number matrix. Note that the appropriate software must be specified for the Control Module memory.

The FD30 & FD10 CM software allows connection to Future Design Controls 300 & 100 Series DIN controllers. Both Series are available in 1/32, 1/16, 1/8 and 1/4 DIN panel sizes with DIN rail mounting available for both the 1/32 and 1/16 DIN sizes. Information on these control Series controls may be found at the following links:
<http://www.futuredesigncontrols.com/300.HTM>
<http://www.futuredesigncontrols.com/100.HTM>

CM software supporting Honeywell, Watlow, Danaher, Eurotherm, Yokagawa and other controller products are or will be available. Refer to the specific FDC brochure available for each control brand as there are limitations depending upon control brand.

OPTIONS: Manual, Screen Covers and USB/Ethernet Cables

Printed Operators Manual

Part Number	(FDC-Orion-M iSeries Operators Manual.pdf)	Price
FDC-Orion-M Operators Manual		\$30.00

Printed Configuration Manual

Part Number	(FDC-Orion-M iSeries Config Manual.pdf)	Price
FDC-Orion-M Configuration Manual		\$30.00

Color Touch Screen Protective Screen Covers

(FDC-200 Series Protective Sheet.pdf)		Price
PS2107	FDC-2010 7" Display / 5 per pack	\$30.00
PS2110	FDC-2110 10" Display / 5 per pack	\$30.00

USB Cables & Accessories

IStick-Panel	USB Panel Mount Adapter	\$40.00
IStick-4X-CVR	USB Panel Mount Adapter-Nema4x	\$75.00

Ethernet Cables

Part Number	Price	Part Number	Price
CA-CAT5E-Patch-7ft	\$10.00	CA-CAT5E-Crossover-7ft	\$10.00
CA-CAT5E-Patch-25ft	\$15.00	CA-CAT5E-Crossover-25ft	\$15.00
CA-CAT5E-Patch-50ft	\$25.00		
CA-CAT5E-Patch-100ft	\$45.00		

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NOTES: Serial Communications (Serial connection to CM)

RS485 Modbus RTU (slave) and RS232 (barcode input) modules

RS485 Modbus RTU input module:

The RS485 module allows FDC's EnVision or other 3rd party software R/W access to specific registers within the Control Module. Download the [Orion-M User Communications Reference Manual.pdf](#) for modbus addressing

DeviceNet, Profibus-DP & other communication protocols

To utilize the RS485 module for other communication protocols download the [Fieldbus Communications Reference Manual.pdf](#).

RS232 Serial input for barcode readers:

The RS232 serial input option allows the Orion to receive up to 16 characters from a standard compatible serial Barcode reader. Data from the bar code reader will insert operator events into the historical data file; there is no limit to the number of events that may be entered manually or with a bar code scanner.

Note: If Serial Communication is used the RS485 module must be included; i.e. if bar code reader is used both the RS485 and the RS232 (used for bar code reader) modules must be specified.

NOTES: Control Module (CM) components, Digital IO, & other options

USB Memory Stick:

A high capacity USB Memory Card is provided to facilitate file transfer to and from the FDC-2107/2110 display. The USB memory card power requirement is 3VDC the matching display's USB port 3VDC power supply (note: many USB memory sticks require higher power (mA) than available & will not work with the FDC-2107/2110 display)

CM: CM components includes the following hardware:

- FC5A-D16RS1: CPU (IO includes 8-digital output & 8 input (DO 6-relay & 2-TTL 24VDC) & (DI 8 24VDC)
- CA2011-8A: Cable (6ft) to connect CPU to GUI
- FC4A-PM64: CPU memory card
- FC4A-PT1: CPU Real Time Clock (RTC)
- FC4A-HPC3: Modbus port to connect control module to loop and monitor input devices
- PS5R-SD24: 24VDC power supply for Display & CPU
- USB Memory 2GB: USB memory stick (3VDC)
- GE1A-C10MA110/SR2P-06: Reset Timer with mounting Socket

CM software is installed and is ready for OEM configuration.

Optional Digital I/O (plugs into CPU) (*note 1)

- FC4A-R161: 16-digital output card (relay 240VAC 2A)
- FC4A-T16S3: 16-digital output card (24VDC source)
- FC4A-T08S1: 8-digital output card (24VDC source)
- FC4A-R081: 8-digital output card (relay 240VAC 2A)
- FDC4-N08A11: 8-digital input card (120VAC)
- FC4A-N08B1: 8-digital input card (24VDC)

Maximum Digital IO Summary for CPU & optional IO modules

- Digital Output: 32 Digital Outputs
 CPU 8-digital out (6-relay and 2-transistor)
 Optional 24-digital out (relay 240VAC 2A or 24VDC)
- Digital Inputs: 16 Digital Inputs
 CPU 8-digital in (24VDC)
 Optional 8-digital in (120VAC or 24VDC)

Optional Analog Input/Output (Remote SP & Retransmission) (*note 1)

- FC4A-L03A1: Two mA or VDC inputs & one mA or VDC out

Optional Serial Communication & Expansion Modules (*note 1)

- FC5A-SIF2: RS232 port for Barcode Reader
- FC5A-SIF3: RS485 Modbus RTU (slave)

Optional Monitor Point 8-channel (6-channel RTD) input module

System supports up to 2 Monitor Input Module (serial connection to CM):

- IO-8TCS: (8-thermocouple input module - isolated)
- IO-6RTD: (6-RTD input module)
- IO-8AIIS: (8- input module 0-20 / 4-20mA - isolated)
- IO-8AIVS: (8-analog input 0-10 / 2-10VDC - isolated)

*Note 1: CM will support up to 7 expansion modules.

(The Monitor Point input module is not a CM expansion module.)