

nCompass CM V2.0 Multi-loop Control System Specifications, Part Number Matrix January 2015

The nCompass CM V2.0 Multi-loop Control system combines all of the features of typical loop controllers, video/chart recorders and data logging systems into a single, intuitive device. nCompass offers 4.3" or 7" color touch screen interface with user configurable runtime features for single, dual or up to 10-loop control systems with the runtime configurable at the device with no PC software required.

In addition to a maximum of 10-loops of control, nCompass can accept up to an additional 15 analog inputs for process monitoring (Monitor Points) for a total of 25 process inputs. The base system is provided with eight 24Vdc digital inputs (DI), two 24VDC and 6 relay outputs (DO) as well as Ethernet (LAN), USB and serial RS485 Modbus ports as standard. nCompass can be expanded to a total of 16 digital inputs, 32 digital outputs, accept analog inputs for remote set point control, retransmit (analog output) process variables and serial RS232 for bar code scanner input for profile ramp/soak file selection or operator event input as a component of data log files.

Individual process controllers, one for each loop in the system, provide reliable, consistent and accurate control. When coupled with the built in ramping profiler they provide automatic, timed control of all processes and outputs of the system. The easy to use profiler function supports simple to complex profile functions including step start "Wait For" logic based upon Loop/Monitor values as well as DI, "Delta SP" logic, up to 99 steps per profile, step jumps, up to 32 events, output defeat per step, alphanumeric file naming, unlimited number of profiles and more.

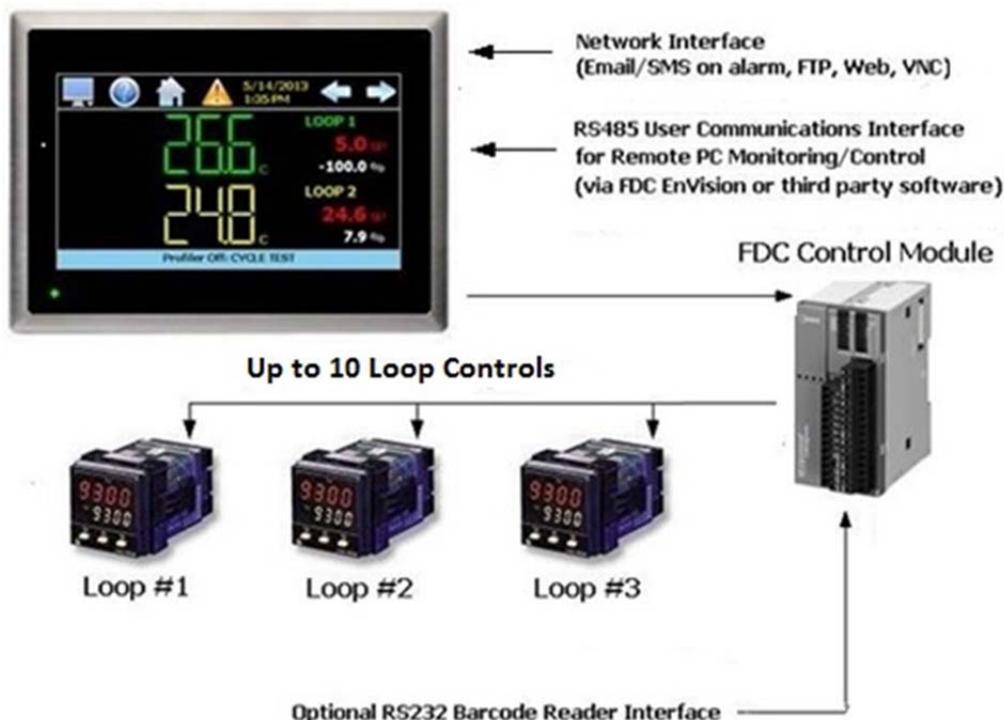
Integrated LAN features include email/SMS messaging upon alarm, FTP (file transfer protocol) for automated file transfer/data backup, remote access (web and VNC embedded servers), national timeserver time synchronization and more are standard. The web page and VNC servers allow remote access using a PC, tablet or smart phone.

nCompass is OEM Friendly!

nCompass is OEM friendly providing a system import/export utility as well as an OEM configurable "reset default settings" utility to allow the end user to reset the system to the OEM's configuration settings.

If you can use a Consumer Phone or Tablet, you can use nCompass!

User configurable with "slide nav" icon based finger navigation similar to "smart devices" or with a traditional drop down menu system, nCompass is intuitive to operate and use. With one touch language configuration for all icons, menus and help screens, nCompass provides ease of use in any one of 28 languages.



How to Order

nCompass CM is ordered as three components, the color touch screen (4.3" or 7"), system firmware and the Control Module (CM) with its assorted options. The loop controls & accessories must be ordered separately.

nCompass CM Sample Part Numbers			
<i>(minimum of 3 component part numbers is required; (1) Display, (2) Firmware and (3) Control Module.)</i>			
<u>Item #</u>	<u>Product</u>	<u>Sample Part Number</u>	<u>Description</u>
1	Display	FDC-0450-1011-000BN	4.3" display, CM software, 11-36 VDC power input, SD slot, Ethernet, USB port, standard enclosure
2	CM Firmware	SD-CM	CM Control Module Firmware (inserted into display SD slot)
3	Control Module	CM-1000-010	CM FD10: No optional DI, DO, AI, AO or serial RS232 (bar code reader), with (1) 8-channel monitor card (T/C)
Options			
	Power Supply	PS5R-SD24	85-264VAC power input, Output 24VDC 60W (2.5A)
	Cable	CA2011-8A	Cable from Display to Control Module (DB9 connector (display), mini DIN on CM, (8ft)
	Loop Controls	9300-413001	FDC 9300 1/16 DIN loop control, input #1 universal (T/C, RTD, mA & VDC) Input #2 linear (mA & VDC (may be used as monitor input)), Output #1 mA PID, RS485 communications

Item #1 Display Selection 450 4.3" or 730 7"

Select the appropriate display, FDC-0450 or FDC-0730 (4.3" or 7") followed by the matrix numbers

FDC - 0450 -

FDC - 0730 -

Order Matrix # 1 2 3 4 5 6 7 8 9

- (1) Power Input**
1: 11 to 36 VDC
- (2) Sound Output**
0: None
- (3) SD Card Slot**
1: Yes
- (4) Ethernet**
1: Yes
- (5) Network**
0: None

- (6) Software**
0: None
- (7) Enclosure**
0: Standard
- (8) Special**
B: Black Overlay
- (9) Special**
N: Neutral Overlay (no name/logo)

Item #2:

Loop Control Firmware

Order Matrix # -

(Fixed characters SD-CM: SD card with CM (Control Module) Display Configuration and SD plugged into display)

Control System Options *(ordered separately as appropriate)*

Control Loops: Order appropriate loop controls separately.

Cable: Control Module to Display

CA2011-8A: Cable from FC5A CPU to display (8ft)

Note: Consult factory for other lengths and options

System Power Supply (input 100-240VAC / Output 24VDC)

PS5R-SD24: 60W power supply

(input 100-240VAC/Output 24VDC 60W (2.5A))

Note: DIN Rail mount 24VDC 60 watt power supply (2.5-amps) to power either display, control module CPU, optional IO and FDC-IO monitor input modules.

USB Memory Stick

UDF115-2GB: (2GB High Capacity USB Memory Stick (3VDC))

System Reset Timer

GE1A-C10HA110 / SR2P-06: Reset Timer and socket (DIN Rail)

Note: Timer is recommended for proper system restart due to momentary power interruptions (<500ms) which can cause false alarms and/or erroneous operation

Printed Operators Manual

Part Number [\(Orion-nCompass_CM_i4.3_User_Manual.pdf\)](#)

FDC-Orion-nCompass CM i4.3 User Manual

Printed Configuration Manual

Part Number [\(Orion-nCompass_CM_i4.3_Config_Manual.pdf\)](#)

FDC-Orion- nCompass CM i4.3 Configuration Manual

USB Cables & Accessories

IStick-4X-CVR

USB Panel Mount Adapter-Nema4x

USB Cable/Panel

Consult factory for referral to low cost cables

DIN Rail Mounting Adapter for 1/16 DIN Loop Controls

DRA-16

1/16 DIN Rail Mounting Adapter

Item #3**nCompass Control Module (loop controls ordered separately)****1. Control Module (CM) Application Software** (loop control type)

- 1: FD10:** CM software for FDC 100 /C/ B41 Series
2: FD30: CM software for FDC 300 Series (note 2)
9: Special

2. Optional Serial Communication (Note 1) (DIN Rail Mount plug into CM)

- 0: None**
2: FC5A-SIF2 (RS232 port for Barcode Reader) * (note 3)
- When Item 2 is specified an RS485 module is included, FC5A-SIF4, that must be installed for proper operation of the barcode reader (RS232).
 - For remote serial communication (3rd party software) an RS485 Modbus port is standard on the display. This port may also be used for FDC EnVision PC based SCADA software.

*Bar Code Reader input is compatible for serial based barcode readers.

3. Optional 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 2: The above optional digital inputs (DI) are in addition to the eight 24Vdc digital inputs that are standard on the CM; system maximum of 16 digital inputs.

4. Optional 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 of optional DO Modules
(maximum of 24 optional DO, System max 32 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 CPU (6 relay & 2 TTL 24Vdc); maximum of 32 DO.

Note 1: CM will support up to 7 expansion Modules made up of any combination of Digital Input, Digital Output, Serial Communication cards and/or Analog Input/Output cards.
(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. FDC's 300 Series loop control's input #2 may be configured as a monitor point. System maximum of 15 monitor points made up of FDC 300 Series loop control input #2, monitor cards inputs or combination of both.

5. Optional Analog I/O (Note 1) (DIN Rail Mount plug into CM)

- 0: None**
1: 1 AI/O card **FC4A-L03A1** (4-20mA or 0-10VDC IO)
2: 2 AI/O 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 quantity 1 Retransmission output configurable for PV, SP or Percent Output.

6. Optional Monitor Inputs (Note 2) (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)
\$248.00

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: Maximum of 2 monitor input cards monitoring a maximum of 15 monitor inputs.

7. Special

0: None

Note 3: CM-XXXXXXX includes the additional standard components:

Part #: FC4A-HPC3 (Note 1 and Note A)
Comms Card (RS485 comms to loop controls and monitor cards)

Part #: FC5A-D16RA1-v2.32
Control Module with 8 Digital Inputs (DI) and 8 Digital Outputs (DO)

Part #: FC4A-PT1 (Note B)
Real Time Clock module

Part #: FC4A-PM64 (Note B)
Memory Module

Note A: FC4A-HPC3 must be plugged into the FC5A-D16RA1 control module during installation as described in the manual.

Note B: The FC4A-PT1 and FC4A-PM64 modules are assembled and contained within the FC5A-D16R1 Control Module.

All other CM (Control Module) options are packaged separately and like the FC4A-HPC3 must be plugged into the FC5A-D16RA1 bus as described in the manuals. The exception is the Monitor Card(s) which are not part of the FC5A-D16RA1 bus and have separate power supply and RS485 communication wiring. The Monitor Card serial RS485 is wired to the FC4A-HPC32 board along with any loop controls.

NOTES: SCADA (Supervisory Control & Data Acquisition)

FDC-nCompass Series Graphic User Interface (GUI) touch screen provides a full SCADA feature set providing ease of use with either an icon menu system with finger navigation or traditional Menu bar, data acquisition, alarm manager, operator audit trail, multi-level security with user rights, LAN connections and more.

The GUI provides ease of configuration, use & support.

- System Configuration for loop, monitor point, alarm, digital input & output assignment / logic, language selection, enable/disable features and more, all without an external device/PC.
- Loop & Monitor Views: view Loop and/or Monitor Points in single, dual and Overview views.
- Trend Views: 8 Trend Views to view up to 8 values per view for Loop and Monitor inputs with each offering configurable L/R axis and time
- Profile: Virtually unlimited number of profiles with each profile having up to 99 steps with up to 32 events and output defeat/step.
- File Management: View and copy/move/delete Profile, Alarm, Historical Data (data log files) and operator audit trial files. File transfer via LAN features (FTP or email) or USB flash memory.
- Support: View loop & digital IO status, force loop & digital outputs and more. OEM configurable "reset factory default" feature.
- 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 alarm, audit and historical data files on demand or automatically (2AM every day).

Data Acquisition:

- Data log up to 10 control loops (PV, SP & % out) and up to 15 optional Monitor Point PVs (up to 25 PV inputs, 10 SP, PID % out; 45 max.).
- Data Log interval: configurable 2-seconds to 31-minutes.
- File Start/Stop: Configurable; operator on-demand, on system boot, profile ramp-soak start/end or digital input.
- 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 with fields for batch & lot information or if started with a profile, name is the same as profile name. (all file names appended with date-time to the second.)
- Operator Comments/Events: Unlimited operator comments/events linked to each file entered manually or via serial Bar Code Scanner.
- File Type: Data Log files are saved in .csv format.
- Digital Signatures: Automatic system signature as well as user entered digital signatures for each data file are supported. Digital Signatures allow the data file to be validated (data has not been altered). Files may be validated on the display or on a PC with Orion Data Viewer.
- Historical Data File: View data log files on the display. Chart is auto-scaled on an X & Y axis for time and units. After data is copied/moved via LAN (FTP or email) or USB Memory, may be viewed on PC utilizing Excel or FDC's free Orion Data Viewer.

NOTES: Monitor Inputs - Optional

(DIN Rail Mount w/serial connection to CM or 300 Series PID control input #2)

Monitor Inputs:

System maximum of 15 monitor points made up of FDC 300 Series loop control input #2, FDC-IO Monitor cards or combination of both.

The FDC-IO modules are DIN rail mount 8-channel isolated thermocouple, RTD (6-channel) or 8-channel linear mA or VDC input modules. A maximum of 2 Monitor input cards may be specified.

FDC's 300 Series loop control's input #2 may be configured as a monitor point with input #2 supporting linear mA or VDC inputs.

Each monitor point is configurable for Alarm setpoints and for profiles step advance "wait for" as well as Delta SP logic

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

NOTES: Power Supply - Optional

Power Capacity Required (Watts) - A base system without options requires ~30 watts of 24Vdc power. The 60W power supply offered is sufficient to power all standard and optional components.

Note: The power supply should be used to power nCompass components only and not OEM or other end user components or devices.

NOTES: Configurable Control Logic

Profile Functions (ramp/soak)

The FDC-nCompass provides for a virtually unlimited number of profiles each with up to 99 steps and up to 32 configurable events per step. Profile functions Start (from any step #), Hold, Continue, Halt (end) are initiated from the display or from DI. Also standard is Step logic for Holdback (Guaranteed Soak) "Wait For" and Delta SP logic per step.

- The "Wait For" step advance logic includes digital inputs and/or loop / monitor points achieving a "wait for" SP.
- The Delta SP may be enabled per step to provide a SP offset (delta) added or subtracted to the highest or lowest loop and/or monitor value sent to the target loop control(s).

Profile selection by serial bar code scan is supported. Refer to section on serial communication.

Configurable Loop Control:

Each of the loop controls PID settings may be configured via the operator interface as well as be used as components in Cascade logic blocks.

Alarm Configuration:

Alarm Annunciation and History File

All alarms except those configured as silent* are annunciated on the display command bar, offer configurable "buzzer" volume and may be reset and cleared by the operator. All alarms, except "silent" are saved in a daily alarm history file with all Alarm configurations allowing for both delayed on and off times.

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 digital outputs (maximum of 32 digital outputs).

DIN Control Loop Alarms (a maximum of 30 alarms for loop & monitor):

The loop controls (up to 10) may have up to 30 alarms configured per loop. The alarms may be configured as latching or not, silent*, inhibit logic and to defeat any digital output. Alarms may be mapped to one of the digital outputs (maximum of 32 digital outputs).

Alarm types include:

- Process, Deviation and Percent Output with all configurable as low, high or both.

Monitor Input (a maximum of 30 alarms for loop & monitor):

Each channel may be configured as Process high or low alarms, latching or not, silent*, 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 outputs)

*Silent Alarms

Alarms may be configured as "silent" with no annunciation of the alarm action nor is it written to the alarm history file; Silent Alarms may be viewed as control output logic.

Digital Input and Output (DIO) Configuration

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

All Digital Outputs (DO) offer:

- Configurable cycle times to pulse an output or no cycle - on 100%
- Configurable time delay to automatically turn DO on as well as off
- Configure DO with counter & alarm message (time on or cycles)

Digital Outputs are configurable as:

- Alarms: Loop, monitor point or digital input alarms
- Event outputs: may be used in ramp soak profiles or when a profile is not running may be enabled/disabled manually.
- Profile Status Output status: run, hold & step change
- Digital Input Outputs: Output active as a result of Digital Inputs

Digital Inputs (DI): CPU includes 8-digital inputs (24VDC).

Optional 8- digital input module (24VDC or 120VAC), maximum of 16 DI.

Digital Inputs are configurable as: (all DI offer configurable time delay (timers) to recognize the DI occurrence.

- Alarm Input
- Alarm Reset (applicable to alarms configured as "latching")
- Data Acquisition start / stop.
- Profile functions; start, hold, continue, end (all events off) and step "wait for" logic.
- Control Output: A DI can enable a DO.
- Defeat Logic; disable/defeat specific or groups of DO and/or DI
- Halt Defrost.
- Redundancy: enable a product redundancy Load Timer
- Disable Communication to loop control SP
 - SP communication disabled: SP values may be changed at loop controls while still monitoring & data log all values.

NOTES: Security and User Audit Trail

Security

The nCompass security model provides tools to add up to 30 users to the system. Each user must have a unique ID, full name and password. Four user levels are provided, System, User, Supervisor and Administrator levels. Specific access rights to over 40 functions can be assigned to each user level as well as password aging and authentication may be implemented globally (applies to all user groups).

Operator Audit Trail

With Security enabled the Operator Audit Trail will display all user actions that affected the system for any given day. Each time a user take an action that affect the operation of the system (changing a set point, start/stop data logging, changes an alarm set point, acknowledge and alarm, etc.), the action is written to a file with a time/date stamp along with the user name or "system" if a user is not logged in. Audit Trail files are encrypted and may be viewed on the display or exported and viewed the free PC based Orion Data Viewer software.

NOTES: Analog I/O: Optional (DIN Rail Mount to 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 set point inputs* and 7 retransmitted PV, Setpoint or % Output values. Refer to the order matrix notes on the maximum number of expansion modules. If other optional cards are specified utilizing all 7 Analog cards is not possible. (* The maximum number of loops is 10.)

NOTES: System Configuration

nCompass has an embedded configuration program and normal runtime allowing full customization & configuration directly from the GUI.

OEM Configuration Program allows:

- Number of Loop Controls, Monitor Points, Digital Inputs, Digital Outputs, Events and Analog I/O with naming assignment for all types.
- Company name, address and telephone are configurable and seen on the system start up splash screen and header on the view only web page.
- Main startup view and menu/features configuration (enable/disable).

Runtime Configuration

The remaining system configuration is completed from the runtime application.

Configuration Import/Export

Simple Import/Export function allows complete configurations to be quickly & easily imported to other nCompass control systems via the USB port.

OEM Configuration of "Reset Defaults" button

To minimize support nCompass offers an OEM configurable "Reset Default Settings" utility to allow the end user to reset the system configuration to the OEM's configuration when shipped.

NOTES: Loop Controls (Serial connection to CM)

Control Module (CM) Software for Loop Controls:

The nCompass CM supports up to 10 PID loop controls and up to 15 monitor points. Monitor Points may be the 2nd Analog Input standard on FDC's 300 Series loop controls or the FDC-IO modules. The FDC-IO modules are available as 8-T/C, 6-RTD, 8-mA or 8-VDC inputs.

The FD30 & FD10 CM software allows connection to Future Design Controls 300 & 100/C Series DIN controls.

Loop controllers/control boards ordered separately.

The FDC 300, 100/C series are available in 1/32, 1/16, 1/8 and 1/4 DIN sizes with DIN rail mounting available for both the 1/32 and 1/16 DIN sizes. Information on these Series controllers may be found at the following links:

- <http://www.futuredesigncontrols.com/300.HTM>
- <http://www.futuredesigncontrols.com/100.HTM>
- <http://www.futuredesigncontrols.com/B41.HTM>

NOTES: LAN Ethernet Communication (connection to Display)

nCompass CM as standard offers LAN connectivity through an Ethernet port located on the touch screen display.

The LAN features include email/SMS messaging on alarm, FTP (file transfer protocol for automated file transfer/data backup), create emails, email opened data, alarm or audit trail files, remote access (web and VNC embedded servers) and national time server time synchronization as standard. The web and VNC servers allow remote access using a PC, tablet or other smart devices.

NOTES: Serial Modbus RS485 Communications (Slave to Master) (connection to Display)

nCompass CM includes a serial Modbus RS485 port located on the touch screen display allowing communication to FDC's EnVision PC based SCADA software or other 3rd party devices (master). Refer to the nCompass CM Communication reference manual for direction and listing of accessible R/W registers.

NOTES: Bar Code Serial Communications (Serial connection to CM)

RS232 (barcode input) and RS485 input modules

RS232 Serial input for barcode readers:

The RS232 serial input option allows the nCompass to receive up to 16 characters from a standard compatible serial Barcode reader.

nCompass allows the bar code scanner to be configured to select a Profile ramp/soak file or to insert an operator event (message) into a running data log file.

-Bar Code Profile Selection:

Data from the bar code reader will prompt the operator if the scanned profile name should be loaded and started.

-Bar Code Data Logging Operator Event Input

Data from the bar code reader will insert operator events into a running historical data file; there is no limit to the number of events that may be entered manually or with a bar code scanner.

RS485 Modbus input module:

The RS485 module (FC5A-SIF4) is included when the optional RS232 module (FC5A-SIF2) is specified for use with a serial Bar code reader. The RS485 module (FC5A-SIF4) is required for the RS232 bar code reader module to function correctly.

Note: As referenced above, nCompass CM V2.0 and later versions include an RS485 Serial Modbus port as standard on the 4.3" and 7" touch screen displays to allow 3rd party software R/W access to specific registers within the system.

NOTES: Language Configuration

nCompass provides a one-button language configuration for the following languages.

- Afrikaans
- Albanian
- Arabic
- Basque
- Belarusian
- Chinese (Simplified)
- Chinese (Traditional)
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Icelandic
- Italian
- Japanese
- Korean
- Norwegian
- Polish
- Portuguese
- Russian
- Spanish
- Swedish
- Turkish

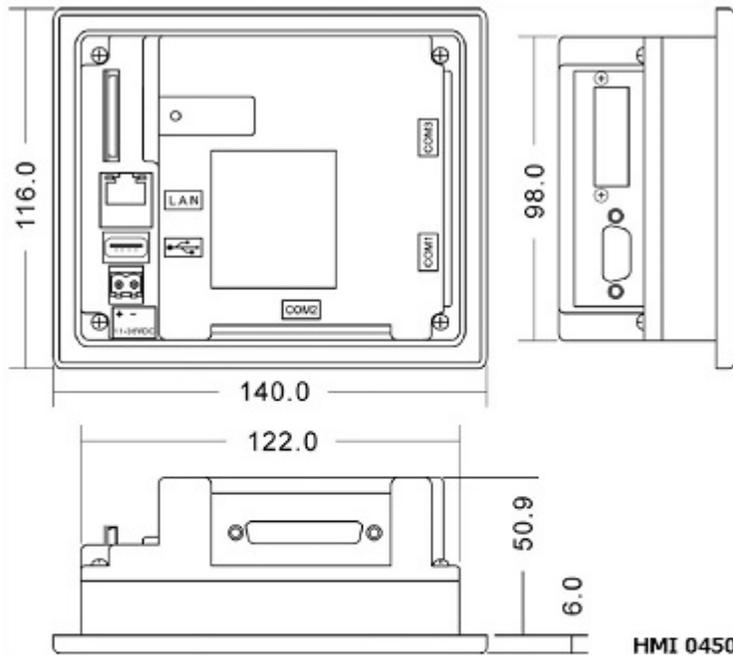
P.O. Box 1196
888.751.5444 Sales

Bridgeview, IL 60455
888.307.8014 Fax

Technical Support: 866.342.5332
<http://www.futuredesigncontrols.com>

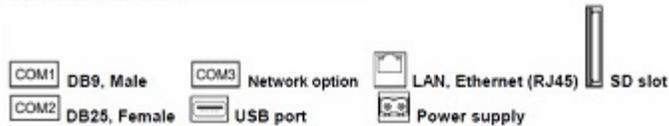
Display Panel Mounting and Overall Dimensions

FDC 450 4.3" Display

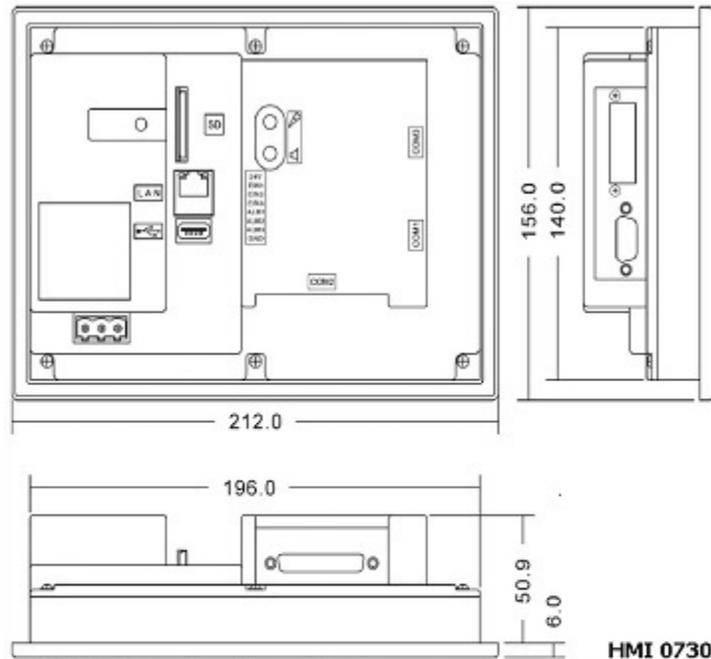


Note: All dimensions are in mm. Tolerance +/- 1 mm.

Panel cutout: 123*1 X 99*1



FDC 730 7" Display



Note: All dimensions are in mm. Tolerance +/- 1 mm

Panel cutout: 197*1 X 141*1

