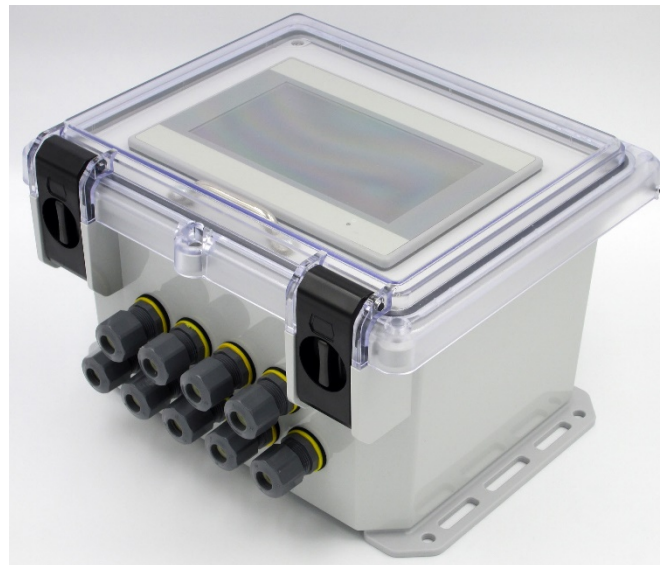


Touchscreen Controller for Smart Digital RS-485 MODBUS RTU RHINO pH, ORP, Conductivity, ISE & D.O. Sensors



Clear hinged latched door provides outstanding protection for advanced touchscreen HMI from environment as part of NEMA 4X rated assembly. To access internal components of controller simply remove two top screws & open with pull handle. On left are 6 each NEMA 6P rated female snappanel mount connectors for plug & play smart digital sensors and 5 each cable glands while on right are 9 each cable glands (all factory installed).



The dual channel Smart controller is shown above with 2 each Smart digital RS485 MODBUS RTU pH sensors connected. Controller is NEMA 4X when the door is latched. Hot swappable sensors with plug & play snap connectors are NEMA 6P rated when interfaced.



Six (6) channel Smart controller with 4 each smart pH sensors connected. Controller is NEMA 4X when the door is latched. Hot swappable sensors with plug & play snap connectors are NEMA 6P rated when interfaced. Controllers with 7.0" touchscreen are available in configurations that are suitable for hazardous Class I, Division II locations.



pH / ORP / ISE / DO / Conductivity Measurement Products Lines

Feature or Functionality	Dual (2) Channel Smart Controller Package	Three (3) Channel Smart Controller Package	Six (6) Channel Smart Controller Package
Interface (HMI)	4.3 Inch Color Touchscreen 3.70" X 2.10" 480 X 272 pixels	7.0 Inch Color Touchscreen 6.11" X 3.42" with 800 X 480 pixels	
Installation Styles	NEMA 4X Assembly with Clear Hinged Latched Protective Door for Touchscreen HMI Package is Ready for Wall or Pipe Mounting in the Field as supplied with support for securing with padlock		
CSA/UL Approvals	Class I, Division II for PLC Non-Hazardous Only for HMI	Suitable for use in Class I, Division II Hazardous Locations for both Touchscreen HMI & PLC ¹	
Calibration Methods	Windows Software / Handheld Battery Powered Communicator / PLC Touchscreen Interface Auto-buffer calibration mode on PLC Touchscreen with 1.68, 4.00, 6.86, 7.00, 9.18, 10.00, 12.45 pH buffers supported Separate slope for acid conditions (pH <7) and alkaline conditions (pH >7) supported for all calibration methods		
Power Configurations	Isolated 24VDC ± 15% ¹ or 85 to 264 VAC Line Power ² or	Isolated 24VDC ± 15% ¹ or 85 to 264 VAC Line Power ² or Non-Isolated 18-75 VDC or Non-Isolated 9.5 to 18 VDC ³	
Max Number of Smart Sensors	2 each Single Parameter or 1 each Dual Parameter	3 each Single Parameter or 1 each Dual + 1 each Single Parameter	6 each Single Parameter or 3 each Dual Parameter
Max Power for HMI & PLC	400mA @ 24VDC for HMI ⁴ 500mA @ 24VDC for PLC ⁴	350mA @ 24VDC for HMI ⁴ 580mA @ 24VDC for PLC & Modules ⁴	350mA @ 24VDC for HMI ⁴ 580mA @ 24VDC for PLC & Modules ⁴
Analog Outputs	2 each Scalable 4-20mA (500 Ω) or 0-10 VDC; Software Selectable	6 each Isolated 4-20mA (Max 500 Ω) or 0-10 VDC Outputs (Software Selectable) Scaling for each output is adjustable from HMI	
Digital Output	MODBUS TCP Slave (a.k.a. MODBUS over ethernet) with registers to access all information that is shown on HMI		
Programmable Contact Relays	4 each SPST Max 2A at 230VAC or 30VDC ⁵	6 each SPST Max 2A at 230VAC or 30VDC ⁵	18 each Isolated SPST Max 2A at 230VAC or 30VDC ⁵
Datalogging	Process Values, Temp & raw mV logged every 30 seconds (with onscreen trending graph); Analytic & Calibration Info logged every 30 minutes. Remote access to logged data over FTP. Capacity 16GB for 2 channel; 32GB for 3/6 channel		
Email Notifications	Email sent to user defined list when high/low relay triggered from max/min setpoint for process value or temperature Diagnostic system warnings such as communication lost with sensor will also trigger email notification		
Remote Access Capabilities	ALL functionality is available remotely using secure Maple Systems EasyAccess 2.0 Supported Remote Platforms Include: Microsoft Windows PC well as Android & iOS Smartphones & Tablets		
Special Features	Seamless hot-swap for identical installations; Compact size	Analog output available to send both process & temp value from each sensor	Very cost effective package for locations with 4 or more installations
Typical Applications & Field Usage	Transmitter, controller, analyzer for use in non-hazardous areas with datalogging & remote access for 1 to 2 channels	Transmitter, controller & analyzer for hazardous locations with integral datalogging & full remote access capabilities for 1 to 3 channels	Transmitter, controller & analyzer for hazardous locations with integral datalogging & full remote access capabilities for 4 to 6 channels

1. For Class I, Div. II areas use isolated 24VDC ± 15% or Class I, Division 2 PS1C1D2 transformer for 3 & 6 Channel Smart Packages
2. For AC line power use isolated & regulated 24VDC transformer (Class 1, Div. 2 version for 3 & 6 channel Smart packages only)
3. Optional isolated DC/DC converter sufficient to energize HMI, PLC & Smart sensors allowing for non-isolated DC operation.
4. For total power add 20mA per measured parameter. Package includes isolated 12VDC power supply to energize Smart sensors.
5. If a higher amperage rating is required than what is specified, please use an ice cube relay that suitable for amperage required and area rating where it is to be installed. Two independently programmable relays are assigned to each measurement channel.

NOTE: Features in blue not available for six (6) channel controllers supplied in special order digital only configuration (MOQ applies).



pH / ORP / ISE / DO / Conductivity Measurement Products Lines

Default Home Screen & Main Menu

Default home screen shows live process & temperature values for all connected Digital sensors & raw absolute mV values for all channels in controller configuration. If the commissioning steps as detailed in page 5 of this manual were successful completed, then sensors added will be shown in this home screen along together with corresponding node address in use for each channel.

If for any reason any of the channels that was setup does not display correctly it is possible to use the "RHINO Windows Datalogging & Graphing Windows Software for 3TX Transmitters with MODBUS Output" to troubleshoot the Digital MODBUS sensor configuration. In this case you would temporarily disconnect the D+ & D- input leads to the HMI and temporarily redirect the output to this Windows software (contact factory for assistance). Please refer to the separate manual for this software for instructions on how to configure it for use with the Digital sensors for such a purpose.

Main Menu is accessible from the home default display screen as shown on top to the right. Exiting from the main menu will load back the default display screen. After a period of inactivity you will also get returned back to the home default display screen.

Subsequent portions of manual detail specific sub-menus or screens that are accessible starting from this main menu. If unsure where as specific menu is located please refer to the table of contents on the previous page six (6).

Main Menu
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Sensor #1: 4.42 pH	Year:18	Item Number: 1439
S1 Temp: 22.3 C	Month:11	Serial Number: 0
S1 Raw mV: 108.3	Serial Letter: 4 *	Days In Service:165.8

Sensor #2: 8.46 D.O.	Year:19	Item Number:18017
S2 Temp: 24.4 C	Month: 6	Serial Number: 0
S2 Raw mV: 15.4	Serial Letter: 3 *	Days In Service: 22.1

Sensor #3:-222.80 ORP	Year:18	Item Number: 1442
S3 Temp: 25.6 C	Month: 11	Serial Number: 2
S3 Raw mV:-222.7	Serial Letter: 4 *	Days In Service:141.5

* 0=A, 1=b, 2=C, 3=d, 4=E, 5=F, 6=g, 7=H, 8=i, 9=J, 10=L, 11=n,12=o, 13=P, 14=r, 15=S, 16=t, 17=U, 18=Y

Controller for MODBUS RTU Sensors

Main Menu Exit

- Select Channel
- Sensor Type
- Calibrate Sensor
- Sensor Diagnostics
- E-Mail Notifications
- Controller Info
- Trend Display

- Hold Channel Output
- Analog Outputs
- Relay Output Limits
- Relay Event Status
- Remote Access 2.0

The clickable items in any of the screens is indicated by being shown in blue and/or shown as a button.

INITIAL COMMISSIONING STEPS:

1. Provide power to touchscreen controller. Depending upon configuration this can be Isolated 24VDC ± 15% (PS0), 85-265 VAC (PS1 or PS1C1D2), Non-Isolated 18 to 75 VDC (PS2) or Non-Isolated 9.5 to 18 VDC (PS3) power type
 - a. **If unsure about correct location & power type to be provided to unit consult factory to avoid damage!!**
2. Determine desired configuration of sensor types to be used for each of the available six channels. It is not necessary to setup all sensor channels at time of commissioning. Channels may be added or removed over the course of time if desired. Note any such changes for any upstream connected PLC, DCS or SCADA.
3. Setup sensor with correct node & baudrate for channel w/ Windows software or handheld communicator (HHC)
4. Configure each sensor type from touchscreen controller for the channel to be used.
5. Plug in Digital sensors terminated with male snap connector (or extension cable terminating in the same) into one of the available female panel mount connector. It makes no difference which sensor type or channel is plugged into which port with the Digital sensor multi-drop RS-485 MODBUS RTU communications.
6. If commissioning was successful, each channel that was display proper sensor type & live values in main screen.
7. Wire up analog outputs and contact relays to be used after configuring them from the appropriate screens.
8. Setup secure remote access with EZAccess 2.0 software. One-time registration is required to Maple Systems.
9. Setup email notifications for trigger events to prompt when remote login might be advisable when not at site.



The handheld communicator (HHC) can both search for the node of the connected sensor as well as to modify the node if desired. Using this battery powered handheld communicator (HHC) to control the node assignments of the MODBUS RTU sensors allows for a very convenient field installation scheme for the commissioning of the advanced touchscreen controllers.

For ongoing maintenance the HHC can modify the sensor node to the desired value for the channel to which it is to be hot-swap exchanged in a plug and play manner for ease of field workflow.

