Pre-Engineered Solutions for Transformer Monitoring, Control and Communication

Features & Benefits

- Flexible & Modular Hardware Platform
- Cooling Monitoring and Control
- Voltage Monitoring and Control
- Annunciator Functions
- Multiple Secure Communication Options
Monitoring

- Temperatures
  - Top Oil
  - Bottom Oil
  - Winding Hot Spots
  - Ambient
- Cooling System
  - Fan/Pump Current
  - Contactor Status
  - Loss of Power
- OLTC
  - Position
  - Operation Counters
  - OLTC Temperature Differential
  - Motor Current
  - Contact Wear
  - Reversing Switch Operation
  - Hunting
- DGA & Moisture
  - Active Moisture Model
  - Serial or Ethernet Link to Sensor(s)*
- Alarms
  - Built-in Annunciator
  - Major/Minor Groups
- Data & Event Logging
  - Chronological Data Log
  - Alarm Log

Control

- Cooling Control
  - Predictive Turn On
  - Fail-Safe Configurable
  - Fan Sequencing
  - Fan/Pump Test
  - Variable Speed
  - Dual Speed Control
- Voltage Control
  - Paralleling Options
    - Master/Follower
    - Circulating Current
    - Reverse Reactance
  - LDC
  - Voltage Graphing Display

Communication

- SCADA Communication
  - Serial
    - Connections: Fiber, RS-485, RS-232 or Powerline Communications (PCS)
    - Protocols: DNP 3.0, Modbus
  - Ethernet
    - Connections: Fiber, Copper or Powerline Communications (PCS)
    - Protocols: IEC-61850, DNP 3.0, Modbus
  - SCADA Test Utility
- Secure HTML Browser-Based Graphical Display
  - Built in security features include multi-level password protection, HTTPS, SSH & SFTP encryption
- Ethernet Switch Function
  - Provides simultaneous connection of Copper and Fiber

Graphical User Interface

- Graphical Display
- Smart Menu Buttons
- Summary Status LEDs

Built-in Web Server

- Secure HTML Browser-Based Graphical Display

Easy-to-Use Configuration Tool

* Consult factory for the most up to date list of compatible sensors.
**Universal Power Supply**
- 85-288 VDC
- 85-275 VAC 50/60 Hz

**Expansion Card Options**
Select from the following card options for slots 1-9. Select no more than 3 Voltage Control cards. Select no more than 2 OLTC Monitoring cards.

**Base System Cards**
- Base A: (2) Form A Relay Outputs +
  - (1) Form B +
  - (2) Form C +
  - (2) DC Analog Inputs/Outputs
- Base B: (3) RTD Inputs + (4) CT Inputs

**CPU & Ethernet Card**
- (1) USB Type B Device Port (Connection to IEDs)
- (1) USB Type B Console (Configuration/Setup)
- (1) USB Type A Host Port (Data Download)
- (1) 10/100 Base T RJ45 Ethernet
- (1) Fiber Ethernet Connection 10/100 BaseFX (Optional)

**Communication Card**
- (2) RS-485 Connections for SCADA or other serial device connections (These EIA compatible connectors can be either two wire or four wire)
  - Optional Serial Port
    - Serial Fiber Optic
    - RS-232
    - RS-485

**System Frame Options**
- DR-C52 Includes Base System Cards with two expansion slots (Slots 3-4)
- DR-C57 Includes Base System Cards with seven additional slots (Slots 3-9)

**Base System Cards**
(see Relay Definitions)

**Expansion Card Options**
(see Relay Definitions)

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*** = Relay Definitions

Form A = SPST-NO. A single, normally open contact that closes upon actuation.

Form B = SPST-NC. A single, normally closed contact that opens upon actuation.

Form C = SPDT. A Form A contact connected to a Form B. The Form C contact has three wires, NO (normally open), NC (normally closed) and C (common). Upon actuation, the NO contact closes (continuity from NO-C) and the NC contact opens (no continuity from NC-C).
**Frame Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>DR-C52 (Base System Cards + Two Expansion Slots)</td>
</tr>
<tr>
<td>7</td>
<td>DR-C57 (Base System Cards + Seven Expansion Slots)</td>
</tr>
</tbody>
</table>

**Packaging Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>DIN / Panel Mounting</td>
</tr>
<tr>
<td>1</td>
<td>Nema 4X Enclosure</td>
</tr>
</tbody>
</table>

**Ethernet Communications**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10/100 Base T (RJ45)</td>
</tr>
<tr>
<td>1</td>
<td>10/100 Base T (RJ45) + Ethernet Fiber Optic (100 Base FX)</td>
</tr>
</tbody>
</table>

**Serial Communications**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Two RS-485 Ports</td>
</tr>
<tr>
<td>1</td>
<td>Two RS-485 Ports + Serial Fiber Optic</td>
</tr>
<tr>
<td>2</td>
<td>Two RS-485 Ports + RS-232</td>
</tr>
<tr>
<td>4</td>
<td>Two RS-485 Ports + RS-485</td>
</tr>
</tbody>
</table>

**Optional Expansion Cards*** (see Relay Definitions)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>None</td>
</tr>
<tr>
<td>A</td>
<td>Base A: (Two Form A Relay Outputs + One Form B + Two Form C + Two DC Analog Inputs/Outputs)</td>
</tr>
<tr>
<td>B</td>
<td>Base B: (Three RTD Inputs + Four CT Inputs)</td>
</tr>
<tr>
<td>C</td>
<td>Digital Input (Thirteen Digital Inputs)</td>
</tr>
<tr>
<td>D</td>
<td>Digital Output (Five Form C Relay Outputs)</td>
</tr>
<tr>
<td>E*</td>
<td>Voltage Control (One Voltage Transformer (VT) Input + Three CT Inputs + Three Digital Inputs + Two Form A Outputs)</td>
</tr>
<tr>
<td>F**</td>
<td>OLTC Monitoring (Two RTD Inputs + Four Digital Inputs + OLTC Motor Current)</td>
</tr>
</tbody>
</table>

* Select no more than (3) Voltage Control cards.
** Select no more than (2) OLTC Monitoring cards.

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For any inquiry, please contact your local Dynamic Ratings office.

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