Red Lion
Introducing
FLEXEDGE™
With Crimson 3.2
Excellence. Redefined.
FlexEdge: The Next Step in a History of Red Lion Innovation
The Challenges of Modern Industry
How do I improve uptime when installing or maintaining equipment?

Even a well-designed network, built to be fault-tolerant, will experience problems that threaten uptime. While the most frustrating issues for plant networks are the intermittent problems that can occur, adding new devices can also cause reductions in overall equipment effectiveness.
How can I cost effectively plan for future reconfiguration or feature upgrades *without* scrapping existing equipment?

In a market of ever-changing customer requirements and increasing rates of innovation, the need for production equipment that can adapt to meet these needs is important.
How can I cost-effectively adapt my IIoT strategy as our needs shift?

As users’ needs change, so too will cloud platform and security requirements. In addition, carrier availability may dictate that a company’s remote monitoring deployments are serviced by multiple cellular providers. It’s important to have a flexible, scalable solution capable of adapting to changing needs.
Gateway for today, **Flex**ible for tomorrow

- Multiple Software packages
- Annual Software Licensing Fees
Combining Automation and Networking

Bridging the IT/OT divide by providing both what they need

**Industrial Automation**
- User Interface Creation
- Protocol Conversion
- Industrial Communication
- Data Acquisition
- Remote Access
- Data Logging
- Sensor I/O and Control
- Alarming
- Enterprise Communication
  - IIOT/Cloud
  - SCADA
  - Historian

**Networking**
- Layer 3 routing
- Firewall
- RADIUS Authentication
- SNMP Agent
- NAT
- DHCP
- IP Fallback and Failover
- Secure access
  - VPN Client/Server
  - IPsec
  - Certificates

Future-proof, scalable communication
Why FlexEdge and Crimson 3.2?
FlexEdge: Improving Network Uptime

• Fewer devices mean less complexity and maintenance
  • Flexedge combines functionality that previously required multiple devices
• Locally store and buffer data when network issues occur
• Onboard diagnostics tools to help troubleshoot
• Rugged, reliable solution with wide environmental range
• Configurable through web interface, similar to typical IT
FlexEdge: Optimizing Capital Investment

• Protocol conversion allows old and new equipment to speak to each other
• RS232 and 485 comms sleds provide additional capability for older, serial protocols
• Communication to modern data analytics infrastructure for predictive maintenance
FlexEdge: Managing Remote Assets

• IP failover, and IP fallback provide cellular and network redundancy
  • Dual SIM cards, dual wireless and wired connections
• Built in I/O and Crimson Control replaces simple PLC functionality
• Sixview Manager and Crimson 3.2 personalities allow easy management of your FlexEdge fleet
Common Applications
Common Applications

- Wastewater Lift Station Remote Access
- Oil Well Pad Data Acquisition
- Centralizing Factory Communication
# Wastewater Lift Station Remote Access

## Requirements
- Secure, remote access
- Easily view remotely what is happening onsite
- Acquire flow sensor, level sensor, and pump status inputs
- Must communicate reliably over cellular 4G network since 3G support is ending

## Solution: DA70A FlexEdge
- OpenVPN encrypted tunnels
- Virtual HMI through the FlexEdge web server allows easy UI creation and data visualization
- Crimson Control with Analog and Digital I/O modules
- Cellular 4G sled with dual SIMs and failover. Future communications sleds become available as new communications standards are adopted
Wastewater Lift Station Remote Access

2\textsuperscript{nd} Carrier with Failover

4G VPN Connection

Virtual HMI via Web Server

Digital control I/O

Analog Sensor Inputs
Oil Well Pad Data Acquisition

**Requirements**

- Connect to existing microwave radio network WAN, local LAN, and local WLAN
- Have Cellular connectivity as a back-up
- Communicate to Google Cloud for company's business intelligence and tracking organization, and SCADA
- Data integrity is essential for government auditing and record tracking

**Solution: DA70A FlexEdge**

- Multiple Ethernet NICs, and Wifi Access Point/Client
- Cellular sled with IP fallback
- Google cloud connector in Crimson, and OPC-UA, or many other protocols for connecting to SCADA. Can connect to both IT and OT networks
- Local data buffering and datalogging in case comms fail
Oil Well Pad Data Acquisition

RS485 Modbus RTU: Oil & water Valves
RS232 Modbus ASCII: Tank Monitor
Modbus TCP: Salt water disposal
Ethernet I/P: Water Allocation
Emerson ROC over TCP: Custody Transfer
RS485 DF1: Gas Separator

All in one device!

Cell Tower
Cloud
X10+
Onsite Personnel
WLAN for local onsite access
Cellular Fallback for redundant comms
Microwave Ethernet Radio
MQTT to Cloud
OPC UA to SCADA
Local Datalogging
SCADA
Centralizing Factory Communication

**Requirements**

- Old factory equipment currently stand alone. Want to be connected to central control room SCADA
- Want maintenance personnel to easily interact with individual, identical manufacturing cells
- Security of factory network is a major concern

**Solution: DA50A FlexEdge**

- RS232 sleds can communicate very old protocols, even through raw serial communication. Can also talk newer SCADA protocols (Sparkplug MQTT, Modbus TCP, etc)
- NAT can allow all equipment in cells to have same IP address within cell’s LAN, simplifying maintenance. Then they can all talk to factory WAN
- Can create Firewall rules that isolate each factory cell from WAN
Centralizing Factory Communication

- System Terminal
- SCADA
- Switch
- FlexEdge DA50A
- Operator Interface
- PLC
- I/O
- 192.168.0.2
- 192.168.0.1
- 192.168.0.3
- 192.168.0.4
- Switch
- NAT Translation
- All subnet masks: 255.255.255.0

Cell 1
- Assembly Equipment
- RS232
- PLC
- I/O
- 192.168.0.1
- 192.168.0.2
- 192.168.0.3
- 192.168.0.4

Cell 2
- Assembly Equipment
- RS232
- PLC
- I/O
- 192.168.0.1
- 192.168.0.2
- 192.168.0.3

Cell 3
- Assembly Equipment
- RS232
- PLC
- I/O
- 192.168.0.1
- 192.168.0.2
- 192.168.0.3

UNRESTRICTED DOCUMENT
FlexEdge Platform

Primary Components

• Base Controller
  – Linux® OS with Crimson®
  – Field-Upgradable Software

• Future-Proof, Scalable Communications

• Available I/O and PID Control Modules
Hardware Features

1. DA70A and DA50A
2. Field-installable Sled
3. Sled Carriage
4. I/O Module
   A. Connect up to 10
5. I/O Module Port
6. Micro SD card slot
7. Ethernet Port (separate NICs)
8. Serial Ports (RS485 and RS232)

= Ethernet
= Serial
# FlexEdge Controller

## Hardware Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>DA50A</th>
<th>DA70A</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100 Ethernet</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Isolated Serial Ports</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Available Port Configurations</td>
<td>1 RS-232, 1 RS-485</td>
<td>2 RS-232, 1 RS-485 (0F) 1 RS-232, 2 RS-485 (0G)</td>
</tr>
<tr>
<td>USB 2.0 Full Speed Host</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>USB 2.0 Full Speed Device</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Comms Sled Support</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>I/O Support</td>
<td>1AI/1DI, 1DO (On-Board)</td>
<td>Up to 10 I/O Modules</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Board Flash</td>
<td>1 GB</td>
<td></td>
</tr>
<tr>
<td>Expansion (micro SD)</td>
<td></td>
<td>Up to 256 GB</td>
</tr>
<tr>
<td>Temp Range C</td>
<td>-40 to 75</td>
<td></td>
</tr>
<tr>
<td>Power Input VDC</td>
<td>12-24 ± 15% 10.2 – 27.6</td>
<td></td>
</tr>
<tr>
<td>Power Consumption W</td>
<td>2.5 W - 5.6 W</td>
<td>4W - 59 W</td>
</tr>
</tbody>
</table>
FlexEdge Hardware

Certifications

UL Class 1, Div 2

ATEX and IECEx

ABS and DNV

Model-Specific Certifications

Planned

Relay I/O modules are NOT ATEX/IECEx and have been derated for UL Class 1 Div 2.
Communications Sleds

**Easily Adapt as Standards Change**

- Field installable
- Adapt to changing requirements
- Future-proof communications
- Hazardous Location Approved
  - UL Class 1, Division II
  - ATEX and IECEx
## Communication Sleds

### Future-Proof Your Applications

<table>
<thead>
<tr>
<th>Feature</th>
<th>DA50A/DA70A Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cellular</strong></td>
<td>SIM Select, SIM Failover/Fallback, Router and, Multi-Radio Support</td>
</tr>
<tr>
<td>• 4G LTE, CAT 4 (CAT 1 for Australia)</td>
<td></td>
</tr>
<tr>
<td>• Dual SIM Card Slots</td>
<td></td>
</tr>
<tr>
<td>• Built-in GPS</td>
<td></td>
</tr>
<tr>
<td><strong>Wi-Fi</strong></td>
<td>Client or Access Point</td>
</tr>
<tr>
<td>• 802.11 b/g/n</td>
<td></td>
</tr>
<tr>
<td>• Up to 4 Simultaneous Clients in Access Point Mode</td>
<td></td>
</tr>
<tr>
<td><strong>Serial (3 Options)</strong></td>
<td>Crimson Support</td>
</tr>
<tr>
<td>• 2x RS232 (RJ12 ports)</td>
<td></td>
</tr>
<tr>
<td>• 2x RS485 (RJ45 ports)</td>
<td></td>
</tr>
<tr>
<td>• Mixed 1x RS-232, 1x RS-485 (RJ12, RJ45)</td>
<td></td>
</tr>
<tr>
<td><strong>USB Host</strong></td>
<td>Crimson Support, Data Logging, Configuration Upload/Download</td>
</tr>
<tr>
<td>• USB 2.0 Compliant*</td>
<td></td>
</tr>
</tbody>
</table>

*Note only compatible with certain USB Storage drives*
I/O and PID Modules

Expand Application Possibilities

I/O Modules Available Now

- 8 Digital Input (DI), 8 Digital Output (DO)
- 8 DI, 8 Relay Output (RO)
- 6 Universal Inputs
- 8 Analog Output (AO)

PID Control Modules Available Now

- PID, RO, AO
- PID, SSR, AO
- Dual PID, RO
- Dual PID, SSR
- Dual PID, SSR, HCM

Install up to 10 modules per DA70A controller

DO = SSR
RO = Relay Output

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Crimson 3.2 Software
Crimson® 3.2

• Crimson® is a device configuration and application design tool
• Previously only automation focused (protocols, data tags, data visualization)
• Now combines advanced networking and security capabilities
  • Addresses OT/IT needs with web interface and Crimson to configure
  • Network security with routing, NAT, VPN, and certificates
  • Automation with 300+ drivers, data logging, visualization, and IEC61131 control
  • Device Personalities allow easier management of a fleet of FlexEdge devices
Crimson 3.2 Capabilities

- Layer 3 routing capabilities
  - Secure access (VPN, IPsec, certificates, etc)
  - Firewall
  - NAT
  - Routing
  - DHCP
- Updated Linux-based operating system provides more flexibility
- Everything in Crimson 3.1 too:
  - User Interface Creation
  - Protocol Conversion
  - Communication
  - Remote Access
  - Data Acquisition
  - Data Logging
  - Simple Control
  - Alarming
  - Enterprise System Communication
Crimson® 3.2 Enabled FlexEdge™

Upgradable Capabilities

- Controllers can be ordered with different capabilities
- Controllers can be upgraded if application changes
  - No need to physically replace controllers
- Crimson® is to be complimentary, controllers can be upgraded via one—time software licenses

<table>
<thead>
<tr>
<th></th>
<th>Networking Gateway</th>
<th>Protocol Gateway</th>
<th>Advanced IIoT Gateway</th>
<th>Advanced Automation Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Web GUI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Crimson</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Networking</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Firewall</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>RADIUS Auth.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Routing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>NAT</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>IP Fallback</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPN Client/Server</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<tr>
<td><strong>Automation</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>300+ Drivers</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>IIoT Connectors</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<tr>
<td>OPC UA</td>
<td>✓</td>
<td>✓</td>
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<td>SQL Sync</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Data Logging</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtual HMI</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Advanced Web Server</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<tr>
<td>IEC Control</td>
<td></td>
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<tr>
<td>Crimson Control</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
What about Crimson 3.1?
Crimson 3.1

• Crimson 3.1 is still supported for HMIs, DA10/30, Graphite Edge Controller, and E3 I/O

• Crimson 3.1 Capabilities:
  • User Interface Creation
  • Protocol Conversion
  • Communication
  • Remote Access
  • Data Acquisition
  • Data Logging
  • Simple Control
  • Alarming
  • Enterprise System Communication
    • Cloud Connectors using MQTT
    • OPC UA
    • SQL Server
Where do I go from here?
Where do I go from here?

• Ask the question: how can gathering data about my plant or process help?
  • How Can FlexEdge help?
    • Flexible communications hardware
    • Industrial automation and Networking built-in one box
    • Remote Access
    • Industry-standard security capabilities
    • Built in I/O
    • Etc

• Talk to us!
FlexEdge Builder Web Tool

Step 1 - Select Controller
FlexEdge™ Builder
Select DA50 or DA70: Please Select...

DA50
1 Comm. Sled
2 Serial Ports
2 Ethernet Ports
USB Device

DA70
3 Comm. Sleds
3 Serial Ports
2 Ethernet Ports
USB Host
USB Device

Step 2 - Select Options
FlexEdge™ Builder
Select DA50 or DA70: DA70

How will it be used?
Protocol Conversion, Web Server, Data Logging

Select built-in serial port options
1x RS-232, 2x RS-485

Choose additional communications options:
4G Cellular for North America - AT&T

Choose additional communications options:
Wi-Fi

Choose additional communications options:
None

Orderable part number for controller shipped with communications sleds pre-installed:
Part Number: DA70D0G1N4BN000

Click to add I/O modules

Request Pricing and Availability

Also sold separately:
Controller: DA70DGNNNNNNN000
Sled 1: DA5000CL9C4SAM000
Sled 2: DA5000F10104AM000
Sled 3: ???
Start Small. Think Big.
Start with the Controller and Add Sleds as You Need Them.

Adapt as you Grow.
Get Started with a Pre-Assembled Solution Today That Adapts as Applications Needs Change.
Intelligent Edge Automation Platform
Q&A
Thank you!

FOR MORE INFORMATION

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