Molex - Encompass™
Enlarge the Communication solutions

Automation University, Poland
May, 21-22 2014
Sebastien Chielens & Dick van Kempen
Who’s Who...

Dick van Kempen (NL)
- Rockwell Europe, Key Account Manager
- European Industry Manager

Sébastien Chielens (FR)
- Business Development Manager. Acting also as Field Application Engineer for Rockwell.
- 19 years of experience in Automation & Industrial Communication.
Molex

- Created in 1938, with 41 production sites in 15 countries.
- Headquarter based in Lisle (Illinois/USA).
- Second largest World wide connector manufacturer
- Worldwide presence, 34.000 employees
- Our solutions in Communication and Connectivity includes:
  - Development Engineering (HW + FW + SW),
  - Manufacturing,
  - Customer Service,
  - Technical Support, Before and After sales,
  - Local sales (EMEA, Americas, Asia)

- Global Encompass™ Partner over +16 years, (under SST and applicom brand names) – more than 30 Industrial Communication products.
  - www.molex.com/link/encompass.htm
Molex Encompass Products referenced

**US market**
- Cable Reels
- GFCI Portable Power
- Lighting
- Wiring Devices
- Grips
- Solderless Terminals

**Worldwide market**
- Interfaces for CIP & Non-CIP Networks
- PC Network Interface Cards
- Applicom NIC OPC Servers
- In-Chassis modules for ControlLogix & CompactLogix
- In-Chassis modules for SLC
- EIP Remote (Linking Device) modules for Logix
- DeviceNet Diagnostic Tools
- PAC Communication modules
In-Chassis or Linking device
Logix communication modules

› Molex proposal:
  – Offer to Rockwell Automation the solution for networks/protocols that are not supported natively in the Rockwell PAC (Ex Profibus, Modbus...)
  – Includes Hardware + Firmware
  – Software includes Windows Configuration console, Windows Live Diagnostic tools, Add-On-Profiles (AOP), documentation, RSLogix samples
  – **100% made « in Molex »**
    - from design (Molex France or Canada) to production (Molex Ireland),
    - including protocol stack (EtherNet/IP, Profinet, ...)

› Molex supports 2 types:
  – **In-Chassis** for ControlLogix, CompactLogix and SLC500
    - Module is plugged in the PLC chassis and communicates with the CPU to exchange IO datas
  – **Remote** (also called « Linking device »)
    - Installed outside the PAC chassis, and exchange datas via EtherNet/IP link.
    - This is not a Gateway, and is much more powerful.
Key advantages as a Bundle solution

By mixing Rockwell Automation & Molex solutions together, you can:

– Propose a solution to bridge with “non-Rockwell-networks” (Siemens, Schneider...)

– Ex: Siemens is pushing usage of Profibus. With the Profibus modules proposed by Molex, Rockwell can:
  • **Totally replace** a Siemens PLC in an architecture
  • Or Rockwell PAC can be **integrated** in a Siemens architecture, and share information from PAC-to-PAC.
  • A machine builder can decide to get Rockwell PAC as main Controller, but can adapt his network choice according to the Region (eg. DeviceNet in US, Profibus in Europe)
In-Chassis modules

- For ControlLogix
- For CompactLogix
- For SLC500
## In-Chassis Communication modules

1- Solutions for ControlLogix PLC (1756 series)

<table>
<thead>
<tr>
<th>Product</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1- PROFIBUS DP (Master and Slave)</strong></td>
<td><img src="image1.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-PB3-CLX-RLL, In-Chassis » PROFIBUS DP Module – Master &amp; Slave</td>
<td><img src="image2.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-PB3-CLX-RLL-CC, Conformal coated</td>
<td><img src="image3.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-PB3-CLXT-RLL, eXtreme Temperature</td>
<td><img src="image4.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>

2- ETHERNET – Modbus TCP and **NEW** industrial Ethernet for Siemens Simatic S7/S5

<table>
<thead>
<tr>
<th>Product</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SST-ESR2-CLX-RLL, In-Chassis Ethernet &amp; Serial module for ControlLogix</td>
<td><img src="image5.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-ESR2-CLX-RLL-CC, Conformal Coated</td>
<td><img src="image6.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-ESR2-CLXT-RLL, eXtreme Temperature</td>
<td><img src="image7.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>

3- SERIAL – Modbus

<table>
<thead>
<tr>
<th>Product</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SST-SR4-CLX-RLL, 4 serial ports, module for CLX</td>
<td><img src="image8.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-SR4-CLX-RLL-CC, Conformal Coated</td>
<td><img src="image9.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• SST-SR4-CLXT-RLL, eXtreme Temperature</td>
<td><img src="image10.png" alt="Illustration" /></td>
</tr>
<tr>
<td>• Version with 2 ports -&gt; See ref. SST-ESR2-CLX-RLL</td>
<td><img src="image11.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>
# In-Chassis Communication modules

1- Solutions for ControlLogix PLC (1756 series)

<table>
<thead>
<tr>
<th>Product</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- AS-interface (Master and Slave)</td>
<td></td>
</tr>
<tr>
<td>• <strong>SST-ASI-CLX</strong>, In-Chassis » AS-i Module – Master &amp; Slave, 2 channels</td>
<td><img src="image1.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>
In-Chassis Communication modules

2- Solutions for CompactLogix PLC

- SST-ASI-CMX, In-Chassis » AS-i Module – Master & Slave

And more to come before end 2014 (See Roadmap details)
## In-Chassis Communication modules

3- Solutions (still available!) for Rockwell SLC

### 1- PROFIBUS DP (Master and Slave)

- **SST-PB3-SLC**, In-Chassis PROFIBUS DP Module – Master & Slave for SLC

### 2- AS-interface

- **SST-ASI-SLC**, In-Chassis 2 ports Asi Module – Master & Slave for SLC
EIP Linking Device modules

For all Logix family:
- ControlLogix
- CompactLogix
- ...

Molex, Encompass Update, Jan 2014
EIP Linking device concept

One UNIQUE module compatible with CompactLogix, ControlLogix et SoftLogix
- Same Data throughput performance as the Chassis module –

! This is NOT a Gateway!

Ideal for remote applications (Ex: water treatment)
- Keep EtherNet/IP as the main backbone
  – No need space in chassis
Remote (Linking Device)

- Real time IO exchange (avg. around 1 ms)
- Direct IO access
- Fully integrated, like in-chassis
- Protocol fully implemented (services, diagnostics, ...).

Gateway

- Protocol conversion (avg around 100 ms)
- PLC program, ladder logic
- Not integrated
- Limited access (I/O only).
## Linking Device (Remote) module

### 1- Solutions for all Logix PLC

<table>
<thead>
<tr>
<th>Product</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- EIP to PROFIBUS DP (Master and Slave)</td>
<td><img src="image" alt="Illustration" /></td>
</tr>
</tbody>
</table>
| • **SST-PB3-REM**, PROFIBUS, Module EIP Linking Device « Remote »  
  Electrical cabinet mounting (IP20) | ![Illustration](image) |
| • **SST-PB3-REM-CC**, Conformal Coated version | ![Illustration](image) |
| • **SST-PB3-REM-R**, PROFIBUS DP, Module EIP Linking Device « Remote »  
  Machine mounting (IP67) | ![Illustration](image) |

### 2- EIP to PROFINET (IO-Controller (master) or IO-Device (slave))

- **Prototype**

<table>
<thead>
<tr>
<th>Product</th>
<th>Illustration</th>
</tr>
</thead>
</table>
| • **SST-PFN-REM**, PROFINET, Module EIP Linking Device « Remote »  
  Electrical cabinet mounting (IP20) | ![Illustration](image) |

(This product is not part of Encompass program)
Key points & New features
# Key Points and New features (1/3)

<table>
<thead>
<tr>
<th>PLC type</th>
<th>Molex Encompass™ Product</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1- PROFIBUS DP</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNIQUE!</th>
<th>Master OR Slave on the same module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantage: 1 part number for both</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNIQUE!</th>
<th>Master AND slave <strong>on ONE module, at the same time</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantage: Data information exchange between 2 Masters.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NEW! - for Harsh application</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eXtreme Temperature (XT)</td>
<td></td>
</tr>
<tr>
<td>Conformal Coated (CC)</td>
<td></td>
</tr>
</tbody>
</table>
Key Points and New features (2/3)

2- ETHERNET
Modbus TCP & Simatic S7/S5 (Client and /or Server modes)

- Unique! 1 port Ethernet + 2 serial ports on ONE module.
- Unique! Bridge Ethernet and Serial networks together
- NEW! « Industrial Ethernet » for Siemens S7 and S5.
- Unique! Extended database, 30,000 words, 30,000 I/O values
- Unique! Modbus TCP + Simatic TCP on ONE module
- Unique! Up to 127 TCP/IP connexions
- Performance! Up to 1000 Ethernet requests/Seconds
- NEW! eXtreme Temperature (XT) + Conformal Coated (CC) versions
ControlLogix to Siemens + Schneider PLCs, Bi-directional Connectivity

- **ETHERNET**
  - Ex: Up to 128 Siemens PLCs from one ESR2 module
  - Ex: Up to 60 Siemens PLCs to one ESR2 module

ONE SST module

Molex, Encompass Update, Jan 2014
3- Serial – Modbus, Master and/or Slave

!Unique! 4 serial ports on ONE module > speed data change

!Unique! Mix Master and/or Slave on different ports

!NEW! For Harsh applications.
- eXtreme Temperature (XT)
- Conformal Coated (CC) versions
Improved Configuration & Diagnostic Soft.

▶ Reduce programming & commissioning time
▶ On-line diagnostics

Configuration tool
Here, mix Modbus + Simatic in ONE

Graphic tool for cyclic configuration

Molex, Encompass Update, Jan 2014
Roadmap
Bringing more solutions to RA
IC Roadmap linked with RA (1/2)

EIP to PROFINET Linking Device (*)

Prototype available

Release planned Q4 CY2014, TBD

(*) This product is not part of Encompass program
IC Roadmap linked with RA (2/2)

In-Chassis modules for CompactLogix

› 1st Module: 1 x Ethernet port + 2 x Serial ports
  – **Step 1**, Modbus (Ethernet + Serial)
    • Release planned for Nov. 2014
  – **Step 2**, Industrial Ethernet S7/S5.

› 2nd Module: Profibus DP Master/Slave
  – Release, Q4/2014
**CompactLogix modules roadmap (1/3)**

**ETHERNET & SERIAL in one**

- In-Chassis module for Rockwell CompactLogix PAC
- SD Card for easy replacement (configuration files saving)

- **Nov 2014**: Protocols
  MODBUS Serial (Master or Slave)
  MODBUS TCP (Client and Server)

- **Q1/2015**: Adding Siemens Industrial Ethernet TCP S5 & S7.
  - Possibility to mix Modbus + Ind. Ethernet at the same time
CompactLogix modules roadmap (2/3)

- In-Chassis module for Rockwell CompactLogix PAC
- SD Card for easy replacement (configuration files saving)
- Two versions:
  - Profibus SLAVE ONLY
  - Profibus Master (DP V0&V1) &Slave
- SD Card for easy replacement (configuration files saving)
- Q1/2015: Released
**CompactLogix modules roadmap (3/3)**

<table>
<thead>
<tr>
<th>2 x SERIAL in one</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In-Chassis module for Rockwell CompactLogix PAC</td>
</tr>
<tr>
<td>• SD Card for easy replacement (configuration files saving)</td>
</tr>
</tbody>
</table>

**MODBUS**

- **Q1/2015**: Protocols
  MODBUS Serial (Master or Slave)
Customer Applications
Water treatment plant

- **Application**: Water treatment plant
- **Network**: EtherNet/IP and Profibus DP.
- **PAC**: ControlLogix
- **Product SST**: Linking Device EIP to Profibus, IP20 (SST-PB3-REM)
- **Advantage**:
  - Keep EtherNet/IP as main backbone.
  - **Decentralized installations**: Install communication modules outside the chassis, nearest Profibus devices (saving cabling cost).
  - PAC with **smaller size** chassis
New trend, with IP67 devices

› **Trend**: Direct mounting on the machine
  – Transfer devices from electrical cabinet (IP20 protection) TO direct machine/installation mount (IP67 protection).

› **Application**: Automotive assembly line

› **Network**: Backbone EtherNet/IP with DLR, and Profibus DP.

› **PAC**: Armor GuardLogix « machine mount »

› **Product SST**: Linking Device EIP to Profibus, IP67 (SST-PB3-REM-R)

› **Molex advantage**: Unique on IP67 market. Same configuration as the chassis model (AOP, AOI, ...). Saving cabling cost
Documentations
Encompass Brochure

» New Updated Encompass Guide

» Hardcopy or PDF

http://issuu.com/molex/docs/987650-6032
Molex IC APPLICATIONS

› New Molex IC app for iPhone
   https://itunes.apple.com/app/id699827784

› New Molex IC app for iPad
   https://itunes.apple.com/app/id699644591
Molex EMEA, local support
Molex EMEA support

- **EMEA Rockwell Key Account**
  - Dick van Kempen - Dick.vanKempen@molex.com, +31 6 11957859

- **Local Sales Engineer**
  - Spain, France, Benelux, Italy, Germany, UK, Nordic, Poland, Russia, ...

- **EMEA Business Development + Field application support**
  - Sébastien Chielens - Sebastien.Chielens@molex.com, +33 616 40 37 29
  - Thierry Bieber - Thierry.Bieber@molex.com, +49 172 72 07 431

- **Customer Service + Inside Sales**

- **Technical Support, EMEA + NA + ASIA**
  - ic.support.eu@molex.com,
  - Dedicated web site:
Thanks
- Questions?