For the complete online modernization and hot cutover of control systems
CIMA+ provides a variety of engineering consulting services, namely in the areas of buildings, infrastructure assets, transportation, energy & resources, project management, environment, and communication systems. Founded in 1990, CIMA+ was created through the merger of several well-established consulting engineering firms. Today, with more than 30 offices across Canada, CIMA+ employs 2,600+ people, over half of whom share ownership in the company.

At CIMA+ we believe that engineering exists to improve the lives of those around us. Sustainable solutions inspired by engineering help to meet the many challenges of today and tomorrow. Because when you engineer for people, you also engineer for a better world.

For over twenty years, employees have ranked CIMA+ among the Best Employers in Canada, according to the Kincentric survey.
CIMA+ expertise in the industrial automation sector includes working with clients in various industries (chemical, gas, heavy and conventional oil), and facilities (mining, refineries, petrochemical, pulp and paper, utilities and water and wastewater treatment). This experience resides in greenfield, brownfield, and turnaround projects.

We understand that control systems operate 24/7 and that any plant disruption or shutdown can cause a significant loss of production and revenue. Recognizing this need, CIMA+ has developed TEMPUS, a proprietary hot cutover tool, which allows for:

- Online commissioning and testing before cutover
- Elimination of plant shutdowns
- A method for terminating the new control system wires with no disruption to the I/O

This solution facilitates the migration of any industrial control system to a new or upgraded platform, without disrupting the plant’s production.

TEMPUS is a control system migration solution that utilizes a CULUS, CSA, NRTL certified, specialized temporary hardware installation that facilitates all the wiring from one control system to another, without disrupting the signals. Once the new system is running the plant, the tool is removed, leaving a new and well-organized control system.

Combined with CIMA+’s automation engineering team, TEMPUS can increase uptime and simplify the entire control system cutover project. By significantly reducing the risks and unknown factors surrounding the migration process, control systems can now be executed at any time with no impact on production. CIMA+ is able to carry out the whole project from conception to completion including construction, migration and commissioning.

The initial steps of a project will be to conduct a pre-migration assessment (PMA), which will include:

- Determining project scope
- Establishing plant system process and control system needs
- Estimating potential savings (increased uptime, critical path reduction, etc.)
- Comparing the costs, schedule, and full project lifecycle of the traditional offline migration, traditional hot cutover, and a hot cutover utilizing TEMPUS to determine the ideal combination of cutover techniques and execution strategy for your project
Full system control
Zero signal disruption
A traditional control system modernization is logistically complicated due to the challenges involved in relocating the wiring from one system to another, without disrupting the signal or impacting the programming.

TEMPUS solves these issues throughout the migration process:

**Step 1:** The new control system is installed and wires are pre-pulled to the marshalling terminal strip.

**Step 2:** Without lifting or affecting the termination of the existing control signal wires, custom interconnection cables are temporarily connected via the TEMPUS pierce probes to the field side of the marshalling terminal strip, as well as the old and new control system cables.

**Step 3:** The old control system wires can now be removed from the marshalling terminals and insulated. Since the primary signal path through TEMPUS acts like a passive jumper, the signal is unaffected by the removal of the wires from the terminal strip. At this stage, the new control system will receive the replicated signal and all inputs and outputs can be brought to this stage. The new logic can now be functionally tested with real site values, while the old control system continues to operate the plant. Commissioning of the new logic is validated with the real field values, eliminating the need for a simulation system. This also allows all applications and logic to be verified. Loop tuning can also be completed, and compared directly to the existing control system using trend screens.

**Step 4:** Once all the testing and commissioning checks are complete, at the press of a button the new control system takes over the primary signal (red signal path to the new control system). This switchover is completely bumpless with the signal buffer circuitry. The old control system will receive the secondary identical signal, allowing the logic in both the old and new control system to function correctly.

**Step 5:** The new control system wires are terminated to the marshalling terminal strip. Since the primary signal is on the new control system, this step has no impact on the signal.

**Step 6:** The TEMPUS interconnection cables and TEMPUS module are removed along with the old control system wires. At this point, the old control system can be demolished.
Typical project timeline

**Faster Commissioning**

<table>
<thead>
<tr>
<th>Conventional Hot Cutover</th>
<th>Day 1</th>
<th>Day 2, 3, 4...</th>
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<tbody>
<tr>
<td>Hot Cutover</td>
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</table>

**Relative Cutover Cost**

- **Cold**
- **Traditional Hot**

**ONLINE CUTOVER**
- Install Temporary Probes
- Install TEMPUS Tools
- Install Temporary Cables
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**As-Building**
- Concept Selection

**FEED Phase**
- Detailed Engineering

**Programming**
- Install Temporary Probes
- Install Tools
- Install Temporary Cables
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Graphics**
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Factory Testing**
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Construction**
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Site Testing**
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Turnover**
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Closeout**
- Connect TEMPUS
- Commission New Logic
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete

**Online Cutover**
- Online Cutover
- System Testing
- Disconnect Temporary Wires
- Online Migration Complete
The TEMPUS system saves time, reduces risk, eliminates shutdowns, and also:

- Allows for complete commissioning and testing with real process values before the cutover
- Reduces project costs by eliminating the need to have additional equipment for process signal simulation
- Presents significant reduction in project lifecycle costs
- Uses the physical signals rather than a communication protocol
- Eliminates disruption of I/O signals
- Is designed to be failsafe
- Has no limit to the quantity of I/O that can be migrated
- Adds flexibility to design and commissioning
- Is non vendor specific and can work on any platform from any supplier, or combination of suppliers
- Control systems work independently with all hardware types from a remote SCADA system, remote I/O, to a DCS/PLC system
- Multiple platforms can be migrated at the same time
- All conventional control system I/O types are supported, including any combination of analog, discrete, isolated, non-isolated, high side, low side, 4-wire loops, 2-wire loops, pulse signals, 5-24 volt, 120 volt, device powered, and control system powered signals