



MODULAR MANUFACTURING

PACKAGED MODULAR SOLUTIONS

In a modular plant, process equipment, instrumentation, valves, pipework, and electrical and control cabling are installed within a structural steel frame or steel container, commonly referred to as a skid or module. Ancillary systems such as electrical heat tracing, thermal insulation, and integrated control and monitoring systems are often incorporated within the module boundary. Each skid constitutes a self-contained process unit and is generally fabricated and assembled off-site under controlled workshop conditions.

A modular plant may comprise several unit operations mounted on a single skid or distributed across multiple skids, which are interconnected on site to form an integrated process facility. The modules are transported to the operating site, where they are lifted into position, aligned, and mechanically and electrically integrated in their final orientation. Following installation at the end-user's premises, the modules are connected to site services and utilities and subjected to on-site testing to support commissioning and start-up activities.

CXControls can manufacture individual modules up to 4 m x 8 m, or contained within 10, 20, or 40ft modified shipping containers, with both front, rear, and side entry/access options. For larger module sizes or complex structures, we work closely with our steel fabricator partners.

Where environmental protection is required, we can provide modular GRP enclosures or buildings to IP68. We can also design and build plants for operation in ATEX environments, including Zones 1 & 2 (Gas) and Zones 21 & 22 (Dust).



[See more in our Process Engineering Brochure](#)

Our modular solutions are designed to be truly plug-and-play, with electrical equipment pre-wired to distribution centres, isolators, or junction boxes, and control and instrument wiring connected to islands of intelligence that include local HMI Operator Panels or Remote I/O Stations that can be plugged directly into the overall site system architecture.

All modules are Factory Acceptance Tested (FAT) to the highest standards and can be client-witnessed before shipment, helping to reduce site activity and de-risk the project delivery.



CHEMICAL



CHEMICAL DOSING AND BLENDING SYSTEMS

Modular skids are widely used for chemical dosing, blending, and injection applications, including acids, alkalis, solvents, and reagents. These systems typically integrate tanks, pumps, instrumentation, control panels, and containment within a compact, pre engineered module, supporting accurate dosing and rapid deployment across multiple sites.

REACTION AND BATCH PROCESSING UNITS

Modular reactors and batch-processing skids are commonly used for speciality, fine, and pilot-scale chemical production. These modules can incorporate reactors, heat exchangers, agitation systems, and control instrumentation, enabling flexible production, rapid scale-up, and controlled operation for hazardous or high-value reactions.

SOLVENT RECOVERY AND DISTILLATION SYSTEMS

Modular distillation, evaporation, and solvent recovery systems are frequently used to separate, purify, and recycle solvents and intermediates. Off site fabricated modules support consistent build quality, improved safety, and reduced site installation effort, particularly for ATEX rated or environmentally controlled applications.

EFFLUENT TREATMENT AND NEUTRALISATION PLANTS

Chemical effluent treatment systems, including neutralisation, precipitation, filtration, and pH correction, are well-suited to modular construction. These skids allow chemical producers to rapidly implement compliant waste treatment solutions, meet discharge consent requirements, and expand capacity as production demands change.

UTILITIES AND ANCILLARY PROCESS SYSTEMS

Modular manufacturing is commonly applied to chemical plant utilities, including CIP systems, chemical storage and transfer skids, heating and cooling packages, compressed air, nitrogen generation, and packaged boiler or thermal fluid systems. These modules provide reliable, repeatable utility provision with simplified integration into existing facilities.



RENEWABLES

BATTERY ENERGY STORAGE SYSTEMS (BESS)

Modular battery storage systems are widely deployed to support grid stability, peak shaving, and renewable energy integration. These modules typically incorporate battery racks, power conversion systems (PCS), protection systems, HVAC, and fire suppression within containerised or skid mounted enclosures, enabling rapid deployment and scalable capacity expansion.

HYDROGEN PRODUCTION AND HANDLING SYSTEMS

Modular solutions are increasingly used for green hydrogen applications, including electrolyser skids, hydrogen purification, compression, and storage modules. Off-site-fabricated systems support the safe integration of high-pressure and ATEX-rated equipment while enabling phased deployment as hydrogen production capacity increases.

BIOENERGY AND BIOGAS PROCESSING PLANTS

A modular plant is well-suited for biogas upgrading, biomethane injection, and biofuel production facilities. Typical modules include gas cleaning, compression, drying, upgrading, and metering skids, enabling repeatable designs, reduced site construction activity, and faster connection to grid or off-take infrastructure.



RENEWABLE HEAT AND THERMAL ENERGY SYSTEMS

Modular manufacture is commonly applied to renewable heat solutions such as biomass boiler plants, heat pump skids, thermal energy storage, and district heating energy centres. These packaged systems allow complex mechanical and control assemblies to be completed off site, improving quality and reducing on site installation risk.

POWER CONVERSION AND GRID INTERFACE MODULES

Renewable generation projects frequently employ modular electrical infrastructure, including inverter skids, transformer modules, switchgear buildings, and grid interface packages. Modular delivery simplifies site installation, supports factory testing, and enables standardised integration with wind, solar, and energy storage assets.



OIL AND GAS

OIL AND GAS SEPARATION AND PROCESSING SKIDS

Modular separation skids are extensively used for upstream and midstream applications, including wellhead facilities, early production systems (EPS), and brownfield upgrades. These modules typically integrate separators, heaters, pumps, control valves, instrumentation, and safety systems within a compact, pre engineered structure, enabling rapid deployment and reduced offshore or remote site installation effort.

PRODUCED WATER AND WATER TREATMENT SYSTEMS

Modular water treatment packages are commonly applied for produced water handling, including hydro-cyclone skids, compact flotation units (CFU), media filtration, and water injection packages. Off site fabrication supports consistent quality, simplified commissioning, and compliance with environmental discharge and reinjection requirements.

GAS COMPRESSION AND CONDITIONING PACKAGES

Modular compressor skids are widely used for gas boosting, export compression, and fuel gas systems. These modules typically include compressors, drivers, coolers, filtration, and integrated control and safety systems, allowing standardised designs, factory testing, and reduced on site hook up.

UTILITY AND OFF SITE SYSTEMS

Modular solutions are routinely applied to oil and gas utilities, including instrument air and nitrogen generation, power generation and distribution, heating and cooling systems, chemical injection skids, and firewater pump packages. Modular delivery improves schedule certainty and facilitates integration into both greenfield and brownfield assets.

METERING, PUMPING, AND TRANSFER SKIDS

Fiscal, custody transfer, and allocation metering systems are frequently delivered as modular skids that integrate metering runs, flow computers, analysers, valves, and control panels. Pumping and transfer skids for oil, condensate, chemicals, and wastewater similarly benefit from off-site assembly, testing, and repeatable compliance with relevant standards.



ENERGY MONITORING

Our project delivery methodology delivers solutions with:

- ✓ **Rapid deployment with minimal site disruption.**
- ✓ **Standardised and repeatable architectures across estates or portfolios.**
- ✓ **Improved data quality and cybersecurity control.**
- ✓ **Easy scalability to accommodate future loads or new assets .**
- ✓ **Off site testing and configuration, reducing commissioning risk.**



SUBSTATION AND GRID INTERFACE MONITORING MODULES

Modular monitoring skids and containerised units are widely used at substations and grid connection points to monitor voltage, current, power quality, harmonics, and frequency. These modules integrate metering, protection interfaces, SCADA gateways, and communications equipment, enabling rapid deployment and compliance with DNO and National Grid requirements.

INDUSTRIAL AND COMMERCIAL ENERGY MONITORING SKIDS

Modular energy-monitoring plants are commonly used across industrial sites, manufacturing facilities, and large commercial buildings. These systems typically integrate multi-circuit metering, power-quality analysers, data concentrators, and local HMI/servers within a single skid or enclosure, providing real-time energy visibility and compliance with ISO 50001.

RENEWABLE GENERATION AND HYBRID SYSTEM MONITORING

Modular monitoring solutions support solar PV, wind, battery energy storage (BESS), and hybrid renewable systems. These modules provide performance monitoring, asset health data, and export/import metering, allowing operators to optimise generation efficiency and meet contractual and regulatory reporting requirements.

MICROGRID AND DISTRIBUTED ENERGY RESOURCE (DER) MONITORING

Energy monitoring modules play a critical role in microgrids and decentralised energy systems. Skid mounted or containerised monitoring infrastructure integrates load monitoring, generation tracking, battery management interfaces, and control system connectivity, enabling intelligent energy balancing and resilience for campuses, hospitals, and remote sites.

CARBON, EMISSIONS, AND SUSTAINABILITY REPORTING NODES

Modular energy monitoring plants are increasingly deployed to support carbon reporting, ESG compliance, and net zero strategies. These units integrate energy meters, environmental sensors, data analytics platforms, and secure communications to provide auditable energy and emissions data across multiple assets or sites.

WATER AND SEWAGE TREATMENT

All CXControls water and wastewater treatment services align with AMP8 regulatory drivers, supporting pollution reduction, environmental compliance, resilience, and carbon-efficient delivery.

MODULAR WASTEWATER TREATMENT & CSO MITIGATION PLANTS

Modular wastewater treatment systems are widely deployed to support CSO spill reduction, temporary flow balancing, and permanent capacity upgrades with minimal disruption to live assets. Packaged biological treatment units (e.g. MBBR, SBR, IFAS) and settlement modules enable rapid installation, seamless integration, and accelerated delivery of AMP8 programmes, ensuring regulatory compliance while maintaining operational continuity.

SLUDGE TREATMENT, THICKENING, & DEWATERING MODULES

Modular sludge treatment skids (thickening, dewatering, and ancillary process systems) enhance operational resilience, odour control, and safety performance. Off-site fabrication supports shorter construction programmes, reduced site activity, and AMP8 carbon-reduction objectives, while delivering improved whole-life cost efficiency.

CHEMICAL DOSING AND PROCESS OPTIMISATION SKIDS

Chemical dosing skids provide control for phosphorus removal, pH correction, coagulation, disinfection, and odour control across water and wastewater assets. Designed in line with relevant safety and chemical-handling standards, factory-tested modules deliver reduced site interfaces, faster commissioning, and dependable compliance with AMP8 frameworks.



ADVANCED AND TERTIARY TREATMENT MODULES (UV, OZONE, POLISHING)

Modular UV disinfection, ozone treatment, tertiary filtration, and nutrient polishing systems support enhanced environmental performance and stricter discharge requirements. Modular delivery enables phased upgrades, early commissioning, and reduced outage durations, helping water companies to meet Ofwat and EA environmental objectives throughout AMP8.

MODULAR POTABLE WATER TREATMENT & RESILIENCE ASSETS

Package water treatment plants and modular resilience assets (temporary, permanent, and hybrid solutions) support drought resilience, new supply schemes and resource initiatives under the RAPID programme. Modular solution delivery enables rapid deployment, scalable growth, and integration with existing treatment assets, maintaining affordability while improving programme certainty and speed.

Across all modular water and wastewater solutions, CXControls provides integrated design, control systems integration, off-site manufacturing, testing, and commissioning, ensuring assets are delivered safely, fully compliant, and ready for seamless operational adoption.



MODULAR ADVANTAGES:



- ✓ **Reduced Project Programme:**
Off site fabrication and assembly can be undertaken in parallel with on site civil and enabling works, significantly shortening the overall project schedule.
- ✓ **Improved Quality and Consistency:**
Controlled workshop conditions allow for enhanced workmanship, repeatability, and compliance with relevant British Standards and project specifications.
- ✓ **Reduced On Site Construction Risk:**
Minimising on-site installation activities reduces exposure to health and safety hazards, supports CDM Regulations duties, and improves overall site safety performance.
- ✓ **Earlier Testing and De Risked Commissioning:**
Modules can be fully assembled and subjected to Factory Acceptance Testing (FAT) prior to dispatch, identifying issues earlier and reducing risks during site commissioning.

- ✓ **Cost Certainty and Predictability:**
Off-site manufacture enables more accurate cost control through a defined scope, reduced site labour, and minimised weather-related disruption.
- ✓ **Reduced Site Labour and Resource Demand:**
Less on site work is required, easing constraints related to skilled labour availability, site access restrictions, and accommodation logistics.
- ✓ **Improved Schedule Reliability:**
Factory based activities are less affected by adverse weather or site constraints, resulting in greater programme certainty.
- ✓ **Enhanced Safety Performance:**
Fabrication in a controlled environment reduces working at height, hot work, and interface risks commonly encountered during site construction.
- ✓ **Scalability and Flexibility:**
Modular designs can be readily expanded, upgraded, or reconfigured by adding or modifying modules, supporting future operational changes.
- ✓ **Simplified Installation and Integration:**
Modules are delivered as pre engineered, pre tested units, enabling rapid installation, simplified interconnection, and reduced hook up complexity.
- ✓ **Improved Access for Maintenance:**
Modular layouts can be designed with maintenance access, lifting points, and isolation interfaces fully considered during the design phase.
- ✓ **Reduced Environmental Impact at Site:**
Shorter site programmes, reduced waste, and fewer deliveries contribute to lower disruption, noise, and overall environmental impact.
- ✓ **Consistent Asset Data and BIM Integration:**
Asset hierarchies, tag data, and documentation can be established early, supporting BIM requirements and effective integration into a Common Data Environment (CDE).

cxcontrols



Cert No. 11635
ISO 14001, ISO 45001,
ISO 9001

Full Services list:

System Software Integration
Business Transformation
Process & MEICA Project Consultancy
Control Panels
Modular Manufacturing
Consultancy & Manpower

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