



# McQuay

## Integration Controller

The McQuay Integration Controller (IC) provides seamless integration of the Satchwell Sigma Building Management System with McQuay chiller equipment.

The McQuay interface enables direct integration with third party equipment parameters and uses Analogue Input/Output and Digital Input/Output object types to interface to the McQuay equipment.

Using the standard features of Sigma, McQuay parameters can be viewed and alarms received via the IC. Logging is also available. The wide range of Sigma monitoring and control schemes can be used to control the McQuay equipment.

The Integration Controller incorporates McQuay's 'Open Protocol' communications. With the provision of equipment specific mapping information from McQuay, the IC can interface to any McQuay equipment which conforms to this protocol.

The IC concept allows the linking of a range of dedicated plant control systems to all the facilities available from Sigma. Centralised plant control is achieved by allowing an operator (located at a Sigma Server anywhere on the integrated system) to view and change parameters of Schneider Electric's own equipment or third party equipment.

The IC can act as a communications interface, providing a common boundary between differing system protocols so that a fully-functional two-way data link is maintained.

Relevant data message parameters from the target system are mapped to standard Sigma analogue and digital input/output objects. By manipulating these objects, the operator can directly monitor equipment status and effect control of selected equipment functions.

### FEATURES

- Provides a consistent user interface with information displayed in the same format as other Sigma objects.
- Maps third party data to standard Sigma objects.
- Centralised plant control from a Sigma Server.
- Cross references McQuay equipment and other controller data, allowing global control strategies.
- Provides, through Sigma, comprehensive graphics. Individual graphics are independent of equipment types.
- Reports alarms intelligently, based on total system activity. Parameters from the McQuay equipment are mapped onto standard Sigma object types, allowing alarm limits to be applied.
- For systems which need additional resilience, the Dual Trunking options provide redundancy and allows for cabling and other communications channel failures. Dual Trunking is available in various combinations of cabling/protocol technologies.
- Supports Sigma analogue and digital objects, i.e. AI, AO, DI and DO.
- Logs objects using the standard logging of Sigma.
- Contingency Logs held in RAM (automatic circular logging of all objects, to provide typically last 24Hrs history (at 15 minute intervals or 100 values per object)). Viewable via Sigma Client, WinCE and/or Web.
- Direct connection of PSTN modem.
- Interfaces using McQuay's 'Open Protocol'.
- Interfaces to the McQuay system at a high level whilst still retaining the integrity of the McQuay system. Failure of one system will not adversely affect the operation of the other.
- Extends opportunities for enhanced chiller control.
- Supports up to 1000 mapped objects. Currently operating sites demonstrate adequate object count for multi-chiller installations.

### PART NUMBER

S-IC3-McQuay-DT . . . . .McQuay Integration Controller with 1 ARCNET port, 2 Ethernet ports and one Σ LAN (secondary) port)  
 Note: On a controller LAN, either ARCNET or Ethernet can be configured (not both).

### ACCESSORIES

- S-DNN-BAT . . . . . Backup Battery, DNN, NiMH (optional)
- 579-1-479 . . . . . Trunking mounting kit (sufficient for two knock-outs) - Allows easy installation to trunking system.



**TECHNICAL DATA**

**Power Supply**

Supply voltage. . . . .	230Vac ±10%. Switch selectable to 115Vac ±10%
Supply frequency. . . . .	50/60Hz ±10%
Power consumption. . . . .	15VA typical, 24VA maximum
Mains fuse. . . . .	400mA anti-surge, 250V.
Battery fuse. . . . .	2A quick blow, 250V.
Heat dissipation. . . . .	10W maximum

**Ambient Temperature**

Operating temperature . . . . .	0°C to +50°C
Storage temperature . . . . .	-20°C to +65°C
Operating humidity. . . . .	10% to 90% RH, non-condensing
Storage humidity . . . . .	5% to 95% RH, non-condensing

**Agency Compliances**

Emission . . . . .	EN 61326:1997, FCC Part 15
Safety . . . . .	EN 60730

**Construction**

Enclosure. . . . .	Mild steel case and cover with plastic side panels
Flammability class . . . . .	UL 94 V-0
Protection class . . . . .	IP 40 by use of the trunking kit.
Dimensions and weight. . . . .	see Fig. 4
Mounting . . . . .	Wall or panel mounting.
Wiring terminals . . . . .	Hard wired to pluggable screw terminal blocks. Accept up to 1.5mm <sup>2</sup> conductor.
Cable entry:. . . . .	Chassis knockouts in top, back, sides and bottom. Trunking kit is intended for use with the rectangular knockouts in the top, bottom and back of the chassis.

**Electronics**

Microprocessor . . . . .	Cirrus Logic 32-bit ARM-720T processor running at 74MHz
RAM:. . . . .	2Mbytes. Battery backed (see power failure reserve).
Real-time clock . . . . .	Maximum error ±100 seconds/month. Battery backed (see power failure reserve)
Flash EPROM:. . . . .	8Mbytes. Supports dual image hot-swap of operating system, and permanent store of all configuration and object data and accumulated values.
LED Indication . . . . .	Two externally visible LEDs, 'Heartbeat' and 'Scan Rate', indicate operational status of the device; internally, two LEDs per port indicate communications and activity.

**Communications**

ARCNET controller LAN. . . . .	RS 485. Data rate 156kbps to 5Mbps. Opto-isolated LAN, max. length of Belden 9502 = 600m @ 156kbps, 20m @ 5Mbps. Max. devices = 31 (16 if dual trunk used)
Ethernet controller LAN . . . . .	Compatible with 10base-T or 100base-TX networks. Data rate 10Mbps or 100Mbps using Cat.5 or better UTP or STP cable. Max. cable length 100m. Max. no. of devices = 31 (16 if dual trunk used).
Σ LAN . . . . .	RS 485, token passing bus (IEEE 802.4), 8 bit asynchronous at 19.2kbps. Opto-isolated (compatible with all non-isolated products). Transorb protected. Daisy chain topology. Max. LAN length (Belden 9502) - 1000m @ 19.2kbps.
McQuay Interconnection. . . . .	McQuay 'Open Protocol' proprietary, simple-interactive-terminal style, RS 232, ASCII, 9.6kbps, non-isolated. Max. distance (3-wire screened cable) - 15m. One physical RS 232 connection to McQuay unit controller or OPM is supported.
Modem port . . . . .	RS 232. Data rate programmable to 19.2kbps. Non-isolated.
Service port . . . . .	RS232. For connecting Laptop/PC with device configuration software. Available on a 'D' Type or a pluggable connector (not both).
HMI (WinCE) port. . . . .	Human Machine Interface for connecting a hand-held computer or similar device.

**McQuay Equipment Supported**

Centrifugal, screw, reciprocating and absorption chillers from McQuay range. Specific device mapping information can be obtained from McQuay.

**Objects Supported**

Maximum number of objects. . . . .	1000 hardware/software objects and 4 fixed function objects (Backup to Flash EPROM, Controller Time, Hours in Service and Scan Rate).
Mapped objects. . . . .	Analogue Input, Analogue Output, Digital Input, Digital Output (software features only)
Software objects . . . . .	Time Schedule, Holiday, Calculation, Degree Day, Setpoint Adjust, Control, Rotation, Optimiser, Programmable

**Power Failure Reserve**

Nickel metal hydride rechargeable battery (continuously trickle charged) giving a typical 90 day power failure back up of data stored in RAM and for the real time clock (assuming the battery is in good condition). An optional 2000mAH NiMH battery pack (S-DNN-BAT) is available for Uninterrupted Power Supply operation. Typically 2.5 hours back-up with module operation. Battery times quoted are for a fully charged battery. Alternatively an external UPS supplying 12Vdc ±20%.

TYPICAL SYSTEM DIAGRAMS

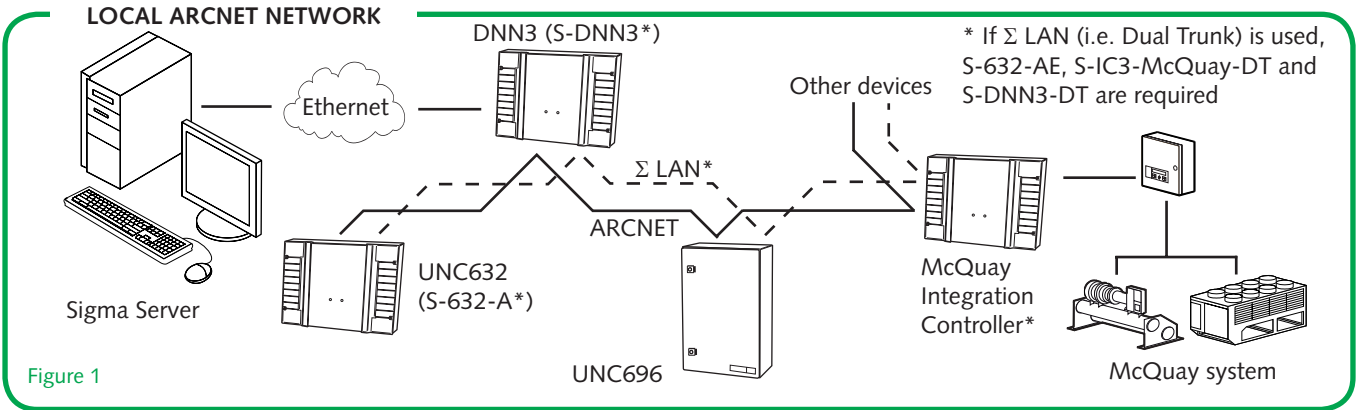


Figure 1

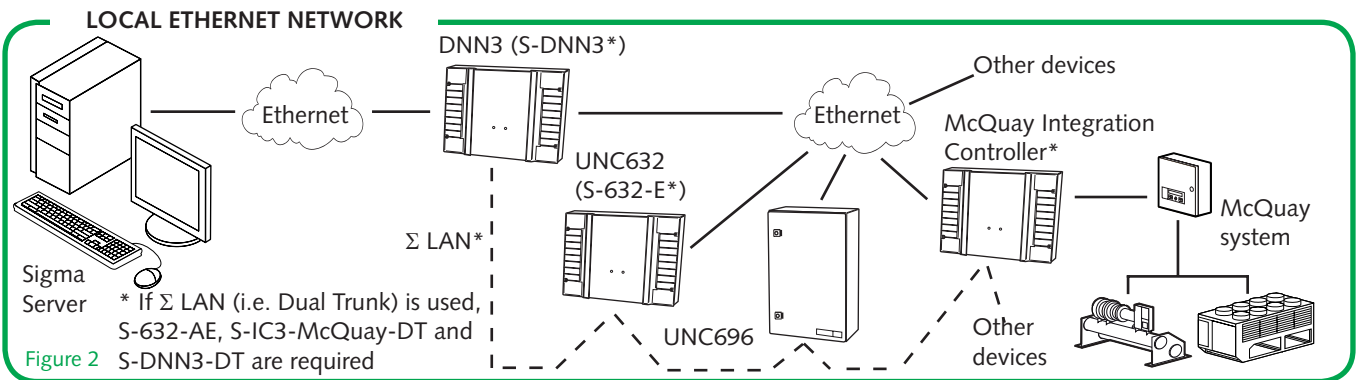


Figure 2

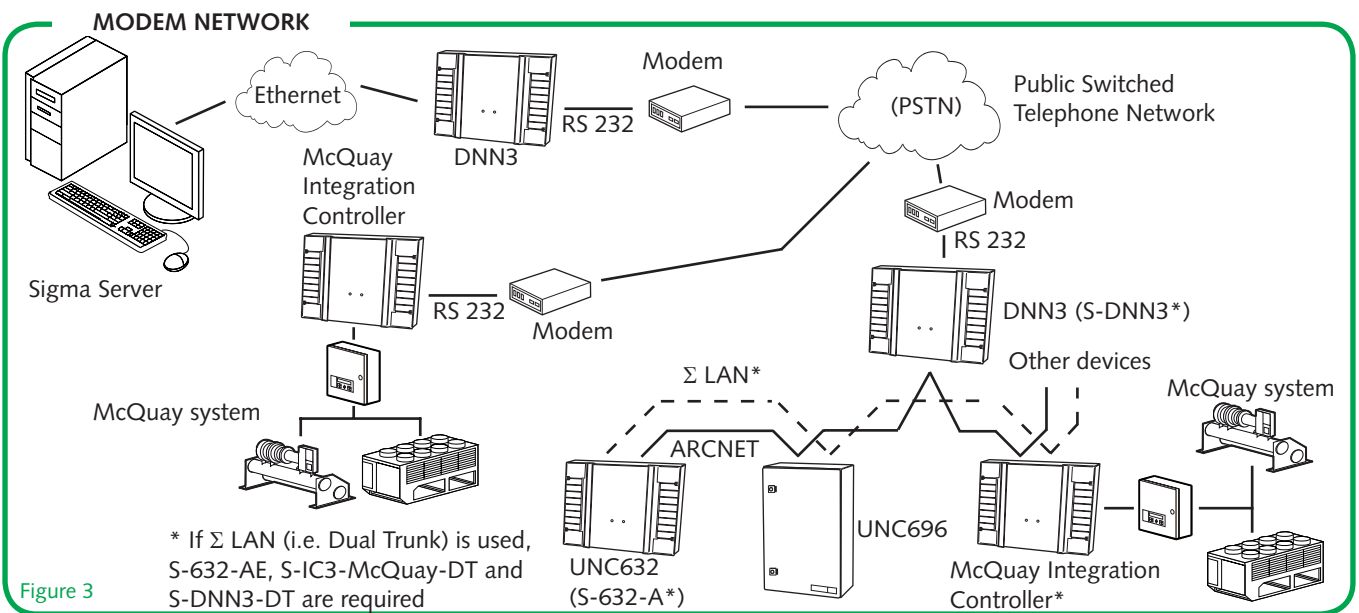


Figure 3

COMMUNICATIONS

ARCNET

ARCNET is a token-passing communications protocol that delivers predictive (deterministic) performance. ARCNET twisted pair connectivity does not require hubs, switches or routers. This RS 485 connectivity allows for a range of speed/distance trade-offs with speeds of up to 5Mbps.

On a Sigma Controller LAN, ARCNET communications allow easy connection to up to 31 devices (plus the DNN3), while on a Sigma Backbone LAN, up to 128 devices can be accommodated via Ethernet with ARCNET as the secondary (fallback) LAN.

ETHERNET

The Ethernet communications protocol provides high-speed 10base-T/100base-TX connectivity to Sigma routers (DNN3s) and controllers (UNCs and IC3s); this equipment can be interconnected either on a Sigma Controller LAN (up to 31 controllers plus the DNN3) or on a Sigma Backbone network.

When used as part of the Sigma Backbone network, the Ethernet network can be either local or wide area.

With the appropriate use of bridges (hubs) and routers (switches), there is no practical limit to the number of devices that can be connected and the

Ethernet communications can operate on networks which operate with different media and at different data rates.

INSTALLATION

This unit should be commissioned as part of a Satchwell Sigma system by a Schneider Electric engineer or an approved Schneider Electric agent.

DOCUMENTATION

- UNC632 - DS 13.312
- UNC696 - DS 13.324
- UNC796 - DS 13.325
- DNN3 - DS 13.424

**DIMENSIONS**

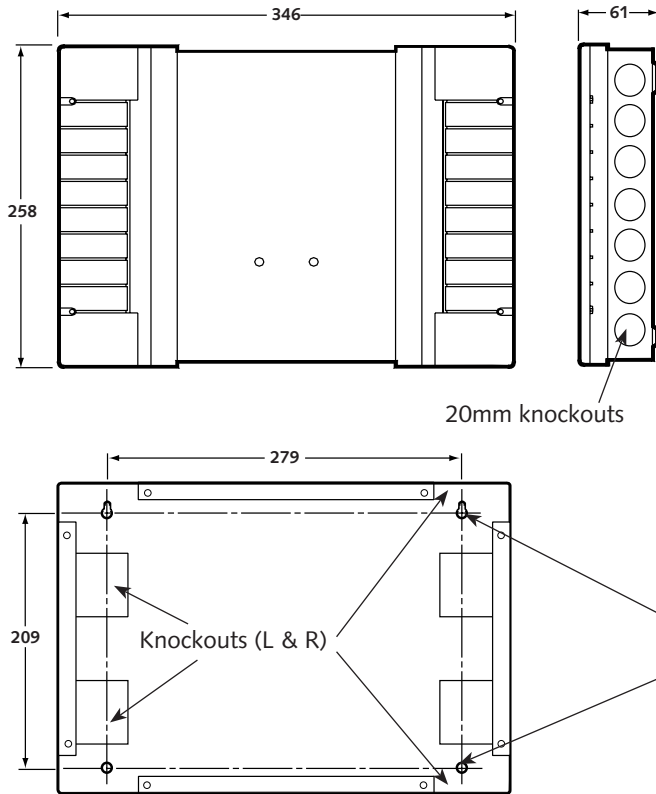


Figure 4

**CONNECTOR LOCATIONS**

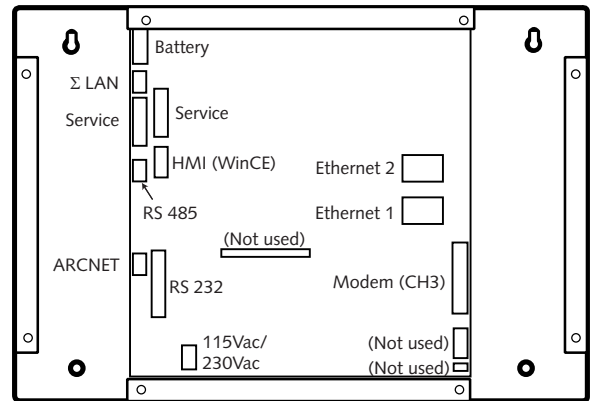


Figure 5

Weight = approx. 2.9kg

**WARNINGS**

THE IC3-McQUAY IS A MAINS OPERATED DEVICE. LOCAL WIRING REGULATIONS AND USUAL SAFETY PRECAUTIONS MUST BE OBSERVED. NOTE EARTHING REQUIREMENTS. THIS PRODUCT CONTAINS A NICKEL METAL HYDRIDE BATTERY WHICH IS COMPLETELY SAFE WHILST IN NORMAL OPERATION. THE BATTERY MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL WASTE REGULATIONS. THE SAME APPLIES TO ANY BATTERIES SUPPLIED AS OPTIONAL EXTRAS.

**Cautions**

- This unit should be commissioned as part of a Satchwell Sigma system by a Schneider Electric engineer or an approved Schneider Electric agent.
- Observe maximum ambient temperature.
- Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.
- If any equipment covers have to be removed during the installation of this equipment, ensure that they are refitted after installation to comply with CE safety requirements.
- Interference with those parts under sealed covers renders the guarantee void.
- Ensure that the IC3-McQuay has a verified good earth.
- It is recommended that the internal wiring in the controller is loomed and identified to aid servicing and extensions to the system.
- A full wiring specification is available from Schneider Electric or your local Schneider Electric agent on request.
- The design and performance of Schneider Electric equipment is subject to improvement and therefore liable to alteration without notice.
- Information is given for guidance only and Schneider Electric does not accept responsibility for the selection or installation of its products unless information is given by the company in writing relating to a specific application.
- It is possible that this publication may contain reference to, or information about, Schneider Electric products (hardware and software), programming or services that are not announced in your country. Such references or information must not be construed to mean that Schneider Electric intend to announce such products, programming or services in your country.
- A periodic check of the Building Management System is recommended. Please contact your local sales office for details.
- All installation wiring must conform to BS 6701:2004 & EN 50174.

On October 1st, 2009, TAC became the Buildings business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.