ELSTER® ENCORE MC1

Electronic station computer for monitoring the gas metering station, acting as a data gateway and for the remote transfer of secured archive data

BRIEF INFORMATION

The station controller & data gateway Honeywell Elster® enCore MC1 is a process computer for recording, processing, evaluating, archiving, and the remote transfer of legally relevant and operating data from gas metering stations.

Its modular process board system and the concept of load by demand software for additional operating functions provides flexibility in use and future-proof expandability. The remote data transfer uses a TCP/IP network and is also available in a wireless version using a UMM cellular modem.

Display and operation are based on a color touchscreen. Operation is intuitive and is similar to a web browser function.

PROCESS STATUS MONITORING

The enCore MC1 monitors process signals such as messages, measurements, counter values, and consumption data from the gas metering station. Malfunctions such as failures, error messages, limit values, and exceeding consumption data are recorded continuously, if necessary compressed into group events, logged, and forwarded as required. A wide range of interfaces is available to record these signals. Galvanic interfaces record message inputs, currents, and pulses which are converted into physical values. Interfaces to primary devices such as HART or encoders record the physical values already provided by the sensor as digital values. Smart measuring instruments such as ultrasonic meters, sulfur chromatographs, or dewpoint meters can be connected using Modbus interfaces. Actual values and the error state of the legally relevant volume conversion devices can be accessed cyclically using DSfG.

The enCore MC1 permanently monitors all these values. Identified messages, limit value excesses, implausible gradients, excessive consumption values, and much more are logged in the event logbook and are registered in the operating data archives.

Group events allow the summing up of operationally relevant errors; a PLC function can perform simple arithmetic and logical operations.

EVENT LOGBOOK AND ARCHIVING

The enCore MC1 saves selected process measurement data, consumption data, and counter values triggered by events or time intervals in archives which can be read remotely. The trigger method can be linked to the event administration. This means that the archive trigger can be linked to a group event: if the group event is active, detailed recording takes place; if it is not active, the recording is stopped to avoid generating any unnecessary data.

MAIN FEATURES

- Monitoring process messages, measurements, and consumption values
- Managing the event logbook and the data archives
- Forwarding process relevant events
- Supporting the following application data protocols: DSfG Class A; DSfG Class B; Modbus TCP, RTU, ASCII; IEC 60870-5-104; SMTP; NTP
- Shunting data between different data protocols
- Operation using graphic touchscreen

OPTIONS

- Data signature for remote data transfer using DSfG Class B
- Up to 3 network interfaces can be used
- Universal cellular modem (UMM)

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DATA COMMUNICATION

The enCore MC1 supports the Modbus data protocol (TCP, RTU, ASCII) as well as the widely used telecontrol protocol defined by IEC 60870-5-104. All the data recorded or processed by the process monitoring system can be placed in Modbus registers or IEC objects and transferred remotely using the TCP/IP network. Thus the enCore MC1 supports all the important functions of a telecontrol device.

The NTP (Network Time Protocol) data protocol is used as standard for time synchronization.

For specific applications the enCore MC1 meets the requirements of DVGW Code of Practice G 485 (DSfG Classes A and B). This enables it to communicate in the metering station as a subscriber on the local DSfG network and provides the functions and connections for the remote data connection for all devices connected to the local DSfG (called a DSfG remote transfer unit RTU).

The range of data protocols supported by the enCore MC1 is completed by the SMTP protocol. The event management uses SMTP to send important event messages as email form to a user defined list of recipients.

The solution for wireless data retrieval is the universal cellular modem (UMM). This cellular router from MC Technologies is specially designed to the enCore MC1 and is parameterized and controlled by it. The UMM is connected to the enCore MC1 using one of the TCP/IP interfaces and supports both packet switched 2G, 3G or 4G networks and circuit switched GSM (CSD) networks. Operation with multiple UMMs on different cellular networks is also possible.

REMOTE TRANSFER OF LEGALLY RELEVANT ARCHIVE DATA

The authenticity and integrity of the data remotely transferred from the local legally relevant volume conversion devices are guaranteed by using a DSfG signature. In this process, an electronic signature based on a cryptographic procedure with asymmetrical keys is added to each volume conversion device data record before it is sent through the DSfG transmission of the enCore MC1.

DATA GATEWAY

The flexibility of the enCore MC1 in handling process data is also reflected in the data gateway function. The content of each DSfG data element, each Modbus register, and each IEC object can be shunted to any point in any other data protocol. For example, diagnostic data from an ultrasonic meter recorded using Modbus, gas companion substances measured with a chromatograph, or the original meter readings from the local volume conversion devices recorded using DSfG can be prepared for dispatching with great ease.

DATA SECURITY

Elster Honeywell has high standards on the data security of its enCore MC1 devices. Sensitive data (e.g., APN, user name, and password) is only visible in a parameter set if necessary. The devices can be parameterized and operated locally or remotely, but the data protocol used for this purpose is cryptographically protected (TLS layer) so that an attacker cannot gain unauthorized access to the device.

Data security of functions and parameters affecting the legally relevant operation of the signature unit in the enCore MC1 is ensured by the security switch and the legal audit trail.

CONFIGURATION AND SERVICE

The Windows application enSuite supports during commissioning and configuration of the enCore MC1 devices. The simple and intuitive user interface enables the devices to be installed quickly. In addition to the device configuration, enSuite also supports the remote operation panel, the archive readout and display functions as well as many other practical functions which feature on Elster enCore devices.

enSuite is available for free download from the Honeywell Elster website and will run in Windows 7 and Windows 10.

ELSTER ENCORE MC1 TECHNICAL SPECIFICATIONS

TECHNICAL DATA	
BASIC FUNCTION	Recording, processing, evaluating, archiving, and the remote transfer of legally relevant and process data from gas metering stations
OPERATION MONITORING	Monitoring process signals from the gas metering station and its periphery Unexpected events are continuously recorded, processed, compressed, logged, and forwarded.
EVENT LOGBOOK AND ARCHIVING	Logging event in the main event logbook Selected process data is stored in archives, which allow remote reading, triggered on an interval and event basis
DATA GATEWAY	Facility to shunt any information between data protocols and telegrams
SIGNATURE UNIT	Supplementing archive telegrams before their remote transfer with a digital signature (DSfG Class B only)
TCP/IP DATA PROTOCOLS	NTP, Modbus TCP, DSfG Class B, MMS, IEC 60870-5-104, SMTP
SERIAL DATA PROTOCOLS	DSfG Class A, Modbus (ASCII, RTU), Uniform, Encoder
CPU3 BOARD	Ethernet (TCP/IP) DSfG Class A (max. 500 kBaud) Serial (RS232, RS485, RS422) 24 V supply voltage
ExMFE5 INPUT BOARD	3 pulse or signal inputs (NAMUR), one suitable for connecting an encoder index 1 input for 4..20 mA (pressure sensor), can be used alternatively for up to 4 HART transmitters (multi-drop) 1 input for Pt100 4-wire resistance thermometer All inputs suitable for connecting intrinsically safe sensors due to their integral Ex supply isolator All interfaces use plug-in screw terminals
MFE7 INPUT BOARD	3 pulse or signal inputs (24 V), one suitable for connecting an encoder index 2 inputs for 4..20 mA, alternatively each can be used for up to 4 HART transmitters (multi-drop) 1 input for Pt100 4-wire resistance thermometer 1 serial RS485 interface (for an ultrasonic meter) All interfaces use plug-in screw terminals
MFE11 INPUT BOARD	8 LF pulse or signal inputs (0/24 V) 3 inputs for 0/4..20 mA All interfaces use plug-in screw terminals
MFA8 OUTPUT BOARD	1 PhotoMOS output (NC, max. 28.8 V, 120 mA) for alarms/messages 3 PhotoMOS outputs (NO, max. 28.8 V DC, 120 mA) for alarms/messages or pulse output up to 20 Hz 4 0..20 mA or 4..20 mA analog outputs for measurements All interfaces use plug-in screw terminals
ESER4 COMMUNICATION BOARD	1 RJ45 for TCP/IP 3 RJ45 for serial communication to RS232, RS485, RS422
POWER SUPPLY	24 V DC +/- 20%, power consumption: max. 12 W/typically 5 W
AMBIENT CONDITIONS	Enclosure IP20 Max. humidity: 90%, non-condensing Ambient temperature: -10 to +55ºC
HOUSING	Plug-in unit in 19" design, 3 height units, 1/3 or 1/2 19" width for a maximum of 4 or 7 boards Hinged frame mounting Overall depth without plugs approx. 170 mm, with plugs approx. 220 mm. Process interfacing at the rear, operation panel at the front
CERTIFICATES	Type examination certificate for signature unit EC-type examination certificate for ExMFE5 process board to ATEX II (2) G [Ex ib Gb] IIC
PARAMETERIZATION	enSuite Windows application for quick, easy commissioning procedure. Additional service functions available, such as remote operation panel, archive readout, etc.

THE
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