The Landis+Gyr FQD 2..7 ripple control transmitter with IGBT-technology

Certainly a good choice
The Landis+Gyr FQD 2..7 ripple control transmitter.

As a compact, three-phase unit it fulfills all requirements of a modern ripple control system component.

Flexible application

The Landis+Gyr FQD transmitter can be used universally in numerous configurations:
- In networks with any capacitive or inductive load changes
- With parallel or series coupling of various types
- Parallel operation with any other transmitters
- As a replacement for rotary converters or static converters of different types.

The Landis+Gyr FQD can therefore be easily integrated in existing systems. The dimensions of the cubicles also correspond to previous transmitter generations. The Landis+Gyr FQD is compatible with existing installed transmitters (e.g. all types of FQA, FQB, FQC etc.).

With two operating modes, the innovative converter software provides great flexibility for the optimum matching to the coupling and network:
1. With voltage control, the transmitter operates in the usual way as an AF voltage source.
2. The new current regulation gives the transmitter the characteristic of an AF current source. This can be a decisive advantage in critical applications.

Optional equipment

The Landis+Gyr FQD transmitter can be adapted to your requirements with numerous options:
- VF channels for sensing, status signals and pilot signal with simplex or duplex transmission
- Local command unit
- GPS for synchronization
- Interface to the telecontrol system
- Control receiver
- Supervision of the coupling.

A block diagram of the Landis+Gyr FQD with the most important options is shown at page 4, Figure 3.

Ready for transmission

The transmitter has a fast response time, as an initialization time is not required after switching on the coupling. Control can be made with a ready signal, a pre-impulse or other conventional signals.

Synchronization with pilot signal transmission or GPS

If more than one transmitter is to control the same network, the telegram start, frequency and phase angle of the audio frequency signal must be synchronized. The following options are available:
- Pilot real-time transmission (pilot frequency)
- GPS receiver or
- Network frequency synchronization.

Simple installation and system extension

Various additional modules can be integrated in the transmitter thanks to the modular construction. The Landis+Gyr FQD ripple control transmitter is installed as a single unit. The external installation is limited to the necessary minimum, and options can be easily retrofitted.
Secure operation

Above all, you expect from a ripple control system that it is reliable. Therefore a robust inverter in IGBT technology is used, which includes a multi-level protection concept for the transmitter and coupling in addition to high efficiency:

- Protected against short circuit and no load conditions
- Voltage and current limitation
- Thermal overload protection.

The audio-frequency pulses injected in the network are monitored with control receivers.

The Landis+Gyr FQD is highly reliable through the use of fully developed series modules for the converter and controls. High immunity in accordance with the EU EMC standards is delivered for the highest operational security.

Through the EMC optimized construction and special protective measures, the transmitter achieves high immunity (EN 50082-2). The Landis+Gyr FQD combines modern technology with more than 60 years of experience. The Landis+Gyr FQD ripple control transmitter is the best choice.

Protected against over-voltages

Naturally, the transmitter also complies with CE safety requirements, especially the low voltage standard. An additional safety feature is the integrated output transformer. It prevents the transmitter against high frequency transient capacitive voltages coming from the high voltage network. This is a decisive advantage for the reliability of your installation.

The voltage isolation between the controls, power electronics, and external inputs and outputs in the transmitter is state-of-the-art.

Figure 1: Arrangement of the Landis+Gyr FQD5

Control unit FQF6 with control receivers (1)
Terminal control signals (2)
Operating panel and optional display panel (3)
IGBT inverter (4)
Fuse isolator (5)
Coupling monitoring (6)
Output contactor (7)
Input terminals (8)
Output terminals (9)

GPS: Global Positioning System. Gives the frequency for the synchronization of the ripple control transmitter.
IGBT: Insulated Gate Bipolar Transistor.

Figure 2: Section mountings on back-wall Landis+Gyr FQD6
Easy to service concept

The easy to service concept simplified commissioning and fault correction. The transmitter is no load proof, and can be operated without coupling for test purposes. The easily accessible modules of the electronic controls can be quickly replaced.

In normal operation, the transmitter does not require any manual intervention. LED indicators give a quick overview of all the signals and faults at all times.

A service program for a PC is available on request (Figure 5). Thanks to professional operator training and self-explanatory user dialogs, you quickly become familiar with the essentials. Diagrams and help texts support commissioning and fault correction.

Remote operation and diagnosis

A dial-up modem, which is connected to the controls, supports remote diagnosis and remote operation (on request). You or our service team can already start fault diagnosis from the workplace. This saves valuable time and gets your system quickly transmitting again.

Comprehensive advice close to you

We would be pleased to advise you on the solution to your requirements with more than 60-years experience in system engineering. Our service team is available to optimally maintain your systems, to correct faults quickly and efficiently, and to offer you services tailored to your requirements.

Figure 3:
Block diagram of the Landis+Gyr FQD ripple control transmitter. In this example, the system controls two transmitters. The pilot reference is made alternatively with an internal pilot source, pilot frequency transmission or a GPS receiver.

Figure 4:
Remote operator’s PC for remote operation and remote diagnosis.

Figure 5:
Some of the user dialog windows of the PC parameter software:
– Operating status: Status of the transmitter and coupling
– Landis+Gyr FQD operating status: Bar chart of the output voltage and current for the 3 phases
– Landis+Gyr FQD status: transmitter parameters
## Technical data

### Landis+Gyr FQD type

<table>
<thead>
<tr>
<th>Nominal power</th>
<th>2...</th>
<th>3...</th>
<th>4...</th>
<th>5...</th>
<th>6...</th>
<th>7...</th>
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<tbody>
<tr>
<td>kVA</td>
<td>40</td>
<td>80</td>
<td>100</td>
<td>160</td>
<td>280</td>
<td>420</td>
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### Configuration

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>No. of couplings</td>
<td>Max. 2 per transmitter, max. 4 per control unit</td>
</tr>
<tr>
<td>No. of transmitters per control unit</td>
<td>Max. 4</td>
</tr>
<tr>
<td>Couplings</td>
<td>Series or parallel coupling universally applicable</td>
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<tr>
<td>Synchronization</td>
<td>On request with pilot transmission or GPS</td>
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<tr>
<td>Control receiver</td>
<td>Max. 4</td>
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<tr>
<td>Coupling monitoring</td>
<td>Different solutions on request</td>
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<tr>
<td>Remote operation/diagnosis</td>
<td>Modern connection (option)</td>
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### Installation

<table>
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<tr>
<th>Cubicle dimensions</th>
<th>WxHxD</th>
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<tr>
<td></td>
<td>80 x 200 x 60 cm</td>
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<tr>
<td></td>
<td>80 x 200 x 60 cm</td>
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<tr>
<td></td>
<td>120 x 200 x 60 cm</td>
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<td></td>
<td>120 x 200 x 60 cm</td>
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</tbody>
</table>

| Cubicle color       | Standard RAL 7035 lichtgrau |
| Power supply connection | 3 x 400 VAC, -10/+15%, 50/60 Hz |
| Protection          | Isolator with fuse-link integrated in cabinet |

### Display/operation

| Local display       | LED display for signal and fault status |
| Service software for PC on request. | PC: at least 486, Graphical user dialog (MS Windows) Parameterization, fault diagnosis, measured values and plain text display. |
| Operating panel (option) | Operating status, fault indication |

### Safety

| Transmitter general test voltage | 2 kV |
| Output transformer test voltage | 4 kV, insulation class F |
| Lightning impulse voltage and intermittent earth fault | Protection by the integrated output transformer |
| AF output | Short-circuit proof thanks to current limit |
| Overtemperature protection | Thermostatically controlled ventilator and protection |

### Power

| Power semiconductor type | IGBT (insulated gate bipolar transistor) |
| Commutation             | Forced commutation |
| Ripple control frequency | 110–1600 Hz, programmable |
| AF output voltage (phase-to-phase) | 400 VAC 400 VAC 400 VAC 400 VAC 760 VAC 760 VAC other on request |
| Constant output voltage | ±10% up to nominal power, when cos Ê < 0.7 ind/cap |
| Transmission frequency stability | Better than 0.01% |
| Converter efficiency | > 98% at nominal load |

### Environment

| Temperature | Without air conditioning, -5 to 40 degrees C |
| Humidity class | F |
| Protection class | IP20 in accordance with DIN 40050, greater protection on request |

### Standards

| Safety | Complies with the low voltage standard: EN61010 Part 1 safety requirements for electrical equipment for measurement, control and laboratory use. |
| Electromagnetic compatibility (EMC) | Complies with the following EMC standards: EN 50082-2 (immunity, industrial environment) Class A, EN 55011 1998 Group 2 (radiated emissions: 150kHz to 1 GHz) |

Combined with our services, the proven series technology the easy to service concept and the high degree of protection guarantee secure operation.

We reserve the right to make technical changes.
Manage energy better

We deliver peace-of-mind when it comes to managing your energy. Decades of leadership in technology and in-depth knowledge at Landis+Gyr means we are able to offer you an extensive, high quality and proven portfolio.

Obtaining the highest level of energy efficiency has never been easier. We have translated our unique expertise of utility processes into integrated energy management solutions and we can help you streamline your processes, increase customer loyalty and secure revenue.

Let us tailor our innovative solutions to meet your specific needs. Whether electricity, water, heat/cold, gas metering or load management, we provide what you need to ensure that your energy is managed with increased precision and reliability.

With Landis+Gyr as your trusted partner, you can manage energy better.

Landis+Gyr in short

- 5000 employees worldwide
- Operations on all five continents
- Broadest portfolio of products and services in the industry
- 25 years of smart metering experience
- 1000 AMM systems delivered
- 300 million energy meters produced
- Largest relevant engineering capacity in the industry
- 60 years of direct load management experience
- 15 million load management receivers produced
- ISO certified for quality and environmental processes
- World leader in integrated energy management solutions
- Committed to improved energy efficiency and environmental conservation

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