Easy CON
Media Converter

User Manual
(Translation of Original docu)
Document Version 1.2

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1 Concept of the Device

The **Easy CON** device from **GOEPEL electronics** connects automotive Ethernet networks using one pair **BroadR-Reach** Ethernet as physical-layer to standard LAN networks with 10Base-T/ 100Base-Tx physical-layer. The device comes with RJ45 connectors on both links. This allows the use of shielded standard low-cost high-quality cables (CAT5 or CAT6) for the test-setup. For easy connection to the ECU cabling harness, an adapter cable with 9-Pol. D-Sub connector is included.

The **Easy CON** Media Converter can be operated as **BroadR-Reach** Master or Slave. Selection is easily done via a switch on the device`s rear plate (not visible in the following figure).

Figure 1-1: Easy CON

2 Use of the Device

2.1 Specifications and Connections

2.1.1 Technical Data

Easy CON Media Converter

- Baud rate: 10 MBit/s, 100 MBit/s (full duplex)
- Forward Delay BroadR Reach to 100Tx: 940 ns
- Forward Delay 100Tx to BroadR Reach: 280 ns
- DC Supply voltage: 4.75 V...5.25 V
  according to USB Specification (micro-USB socket)
- DC Input power: 2 W
- Operating temperature: -40 °C...+80 °C
- Protection: IP 20
- Dimensions: 24 mm x 63.6 mm x 80 mm (H x W x D)
- Weight: 112 g

Power supply

- Cable length: 1 m
- Output connector: micro USB
- AC Input voltage: 90 V...264 V
- AC Input current: max. 250 mA
- DC Output voltage: 5 V
- DC Output current: max. 1000 mA
- Plug type: Euro
- Power rating: 5 W
- Ripple and Noise: 200 mV Pk-Pk
- Efficiency: 74 %
- Type: Switch mode
- Class: 2
- Weight: 80 g
- Input plug type: EU, US, UK, SAA
  (Interchangeable Mains Connectors included)
- Safety Approval: IEC60950-1, UL/cUL60950-1 (LPS)

Figure 2-1: Power supply

2.1.2 Connection

Node 1 ("Ethernet" socket) must be connected to a 10Base-T/ 100Base-Tx Fast Ethernet device. This can be an Ethernet Switch or another Ethernet card (e.g. PC). Most Ethernet cards will support 10Base-T/ 100Base-Tx Baud rate, otherwise use an Ethernet Switch to connect to 1000Base-Tx networks.
Use CAT5 or CAT6 patch cables. The use of crossover cables is not required: The **Easy CON** device has an integrated Auto-crossover Switch, detects the required connection type and configures the connection appropriately.

Node 2 ("BroadR-Reach" socket) must be connected to a **BroadR-Reach** Ethernet device. Use CAT5 or CAT6 patch cables or the provided D-Sub 9-pol. Adapter.

Please note: **BroadR-Reach** Ethernet devices can be either link master or link slave.
If the connecting device is a link master, then the **Easy CON** device must be configured as slave. If the connecting device is a link slave, then the **Easy CON** device must be configured as master. Use the Master/ Slave sliding switch at the rear plate near the **BroadR-Reach** socket for this.

Please connect the micro USB connector to the **Easy CON** device and plug the enclosed power-supply into a wall-outlet.

2.1.3 Liability and Warranty Limitation

The **Easy CON** media converter is not intended and has not been designed and tested for use in a safety relevant application. Do not use the device for any safety relevant system or sub-system inside a vehicle.

Using such a device inside a vehicle to control vehicle main functions can be dangerous and cause the whole vehicle to malfunction.

In no event shall **GOEPEL electronics** be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to procurement of substitute goods or services; loss of use, data, or profits; business interruption; injury or possible loss of life) arising in any way resulting from the use of the **Easy CON** media converter device.

2.2 Interfaces

2.2.1 Node 1

„Ethernet" socket

Physical layer: 10Base-T/ 100Base-Tx Fast Ethernet
Auto-crossover MDI-X

Connector type: R45 socket with Status LEDs

Pin	10/100 BaseTx
1	Tx+
2	Tx-
3	Rx+
4	not connected
5	not connected
6	Rx-
7	not connected
8	not connected

2.2.2 Node 2

Physical layer: BroadR-Reach one pair Ethernet

Connector type: R45 socket with Status LEDs

Pin	BroadR-Reach
1	TRx+
2	TRx-
3	not connected
4	not connected
5	not connected
6	not connected
7	not connected
8	not connected

Adapter cable RJ45 to D-Sub 9-poles included in delivery
(CAT6 Patch cable truncated to D-Sub 9-poles TRx+ (Pin 4) and TRx- (Pin 5), Shield (Pin 3), plastic cover

Pin-out D-Sub Adapter cable

D-Sub (plug)			RJ45	
Pin	**BroadR-Reach**		**Pin**	**BroadR-Reach**
1	not connected		1	TRx+
2	not connected		2	TRx-
3	Shield		3	not connected
4	TRx+		4	not connected
5	TRx-		5	not connected
6	not connected		6	not connected
7	not connected		7	not connected
8	not connected		8	not connected
9	not connected			

2.2.3 Status LEDs

Easy CON provides some information regarding the device operating status and the status of the two links.

The individual **Status LED** at the front side indicates the following states:

- **YELLOW** constant on: Device initialization (after RESET)
- **GREEN** alternating: **BroadR-Reach Link** search
- **GREEN** constant on: **Broad-R Reach Link**/ no **10BaseT/100BaseTx Link**
- **BLUE** constant on: **Broad-R Reach Link**/ **10BaseT/100BaseTx Link** stable
- **RED** alternating: Operational malfunction
- **RED** constant on: Hardware malfunction

10BaseT/100BaseTx Phy Status LEDs (socket near power supply)

10BaseT/100BaseTx Phy Status LED 1 (left)

- **GREEN** constant on: **10BaseT/100BaseTx Link** stable
- **GREEN** alternating: Link activity – carrier found

10BaseT/100BaseTx Phy Status LED 2 (right)

- **YELLOW** constant on: Link speed 100 Mbps
- OFF: Link speed 10 Mbps

BroadR-Reach Phy Status LEDS (socket near sliding switch)

BroadR-Reach Phy Status LED 1 (left)

- **YELLOW** constant on: **Broad R Reach Link** stable

BroadR-Reach Phy Status LED 2 (right)

- **GREEN** alternating: Link activity

2.3 First Steps

1. Connect your **Easy CON** device via the supplied USB cable with the supplied Wall Power Supply
2. Set the Sliding switch at the **Easy CON** to **Master** or **Slave** according to the application
3. Plug in the **Network cable** and **BroadR-Reach Adaptor** according to the inscription of the casting
4. In the case the Status-LED shines **blue**, a stable **BroadR-Reach** connection as well as a stable **Network**-connection have been established

You may dowload this documentation also under www.goepel.com/automotive-test-solutions/easycon-brr.

3 Accessories

As **accessory** for **Easy CON** the following devices are delivered:

- 1 **Wall Power Supply** (Figure 2-1)
- 1 **Adapter cable** RJ45 to D-Sub 9-poles