

The logo for 'tron' features the word in a bold, lowercase, sans-serif font. The letter 'o' is replaced by a green circle with a white center, and a registered trademark symbol (®) is positioned to the upper right of the 'n'.

**tron<sup>®</sup>**

**RF Subsystems & Components**



Tron Elektronik A.S benefits from the experience gained for more than 20 years in design and production of Broadband CATV network products.

Tron Elektronik A.S has in-house Research & Development Engineering Department with multi-disciplined and focused experienced engineers with up-to-date test measurement hardware, software facilities mainly dedicated to RF technology.

Tron has successfully accomplished many R&D projects under National Support Programs by TÜBİTAK (The Scientific and Technological Research Council of Turkey, <http://www.tubitak.gov.tr/en>).

More than %90 of sales turnover is generated by products of our own design and major engineering contributions.

In recent years, we are in a phase of transforming our know how and experience into various genuine products within our core business in optical systems (FTTB/FTTH) and digital TV systems.

Custom designed RF sub-assemblies and components; aimed for professional & defense radio communications is another growing core business area of Tron since 2010.

Tron has strategic partnerships of key product developments for Turkish Defense Industry.

We have the commitment of continuous improvement of quality management across all services we deliver.



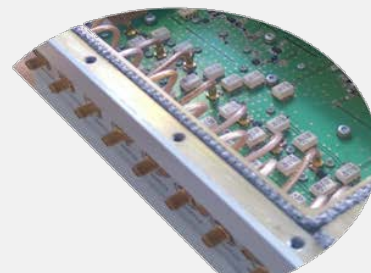
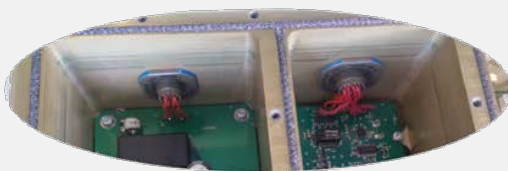
## Overview

Multicouplers are key component in radio communications.

In wideband reception systems; several receivers are connected to a single (or dual) antennas by multicouplers in such a way that the equipment impedance is properly matched to the antenna impedance.

Key quality indicators of multicouplers are; low noise figure, low intermodulation distortion, high port to port isolation, high degree of environmental protection and electromagnetic immunity.

Tron developed 3 versions of multicoupler in HF, VHF and VHF/UHF bands with various input and output configurations. All multicouplers are remotely controllable over RS232.





## Overview

**TR30-162** is a series of broadband HF multicouplers with switchable dual antenna input ports directed to 8 or 16 output ports.

Remote control over TCP/IP enables switch matrix configuration and pre-amplifier activation at each antenna input port.

The performance is characterized by a low noise figure, high intermodulation products suppression and port to port isolation.

19" professional compact housing provides ultimate EMI shielding. Either the standard AC mains or an optional 24Vdc supply can be used for powering.

## Features

- Frequency range 1-30MHz,
- 2 antenna RF inputs ports and 18 RF output ports,
- Each antenna port is switchable to either 8 or 16 outputs (1/8 or 1/16 modes),
- Pre-amplifiers are ON/OFF remotely switchable at each input ports,
- 4 dB nominal gain under 1 / 8 mode,
- Dynamic or static IP setting,
- MAC or IP address upgradable over RS232 port,
- Multitasking available at each individual 16 output ports,
- BNC type antenna input and SMA type RF output connectors,
- Surge and high ambient protection at each RF port,
- 220 VAC powering.

**Specifications**

Feature	Spec
<b>Frequency Range</b>	1 MHz - 30 MHz
<b>Number of Antenna Inputs</b>	2 (BNC type female)
<b>Number of Outputs</b>	16 (SMA type female )
<b>Operation Type</b>	Active or passive selectable
<b>Gain</b>	4 dB $\pm$ 1 dB (in 1/8 mode) & 1 dB $\pm$ 1 dB (in 1/16 mode)
<b>OIP2 / OIP3</b>	min. 20 dBm (in 1/8 mode) & min. 17 dBm (in 1/16 mode)
<b>VSWR (Input / Output), 50 Ohm</b>	2.0:1 / 1.7:1
<b>Maximum Input Signal (CW)</b>	+13 dBm
<b>Power Supply</b>	230VAC (commercial type)
<b>Dimension</b>	W483 mm x D230 mm x H88 mm
<b>Remote Access</b>	RJ45 Ethernet
<b>Options</b>	28 VDC powering optional



## Overview

**TR3000-216** Multicoupler is our latest broadband, high performance unit designed for compatibility with wide frequency range signal collection and signal analysis systems requiring up to 16 outputs from a switchable dual antenna inputs.

Remote control over TCP/IP enables switch matrix configuration and pre-amplifier activation at each antenna input port.

BITE (Built-in test equipment) features as a part of the system to enable testing and perform diagnostics to support the maintenance and fault management.

Performance is characterized by a low noise figure, high intermodulation products suppression and port to port isolation. 19" professional compact housing provides ultimate EMI shielding.

Either the standard 28Vdc powering or 110/220VAC mains can be used for powering.

## Features

- Frequency range; 20-3000MHz,
- 2 remotely switchable antenna RF inputs ports and 16 RF output ports,
- Pre-amplifiers are ON/OFF remotely switchable at each input ports,
- 8dB nominal gain,
- Dynamic or static IP setting,
- Built-in test equipment (BITE) for fault management,
- MAC or IP address upgradable over RS232 port,
- Multitasking available at each individual 16 output ports,
- N type antenna input and SMA type RF output connectors,
- D38999 type power and data port connectors,
- 28VDC powering.

**Specifications**

Feature	Spec
<b>Frequency Range</b>	20 MHz – 3000 MHz
<b>Number of Antenna Inputs</b>	2 (N type female)
<b>Number of Outputs</b>	16 (SMA type female )
<b>Operation Type</b>	Active or passive selectable
<b>Gain</b>	-1 dB $\pm$ 3.5 dB
<b>OIP2 / OIP3</b>	min. 15 dBm
<b>VSWR (Input / Output), 50 Ohm</b>	2.0:1 / 2.0:1
<b>Maximum Input Signal (CW)</b>	+13 dBm
<b>Power Supply</b>	28VDC (D38999)
<b>Dimension</b>	W483 mm x D230 mm x H88 mm
<b>Remote Access</b>	13 pin D38999 (Ethernet)
<b>Options</b>	BITE (Built in Test Equipment) feature diagnosing the whole active and passive blocks within the unit in order to identify any possible malfunction and/or maintenance purposes. 28VDC or 230VAC optional powering.





### Overview

**TR500-18** is a series of broadband VHF multicouplers with single antenna input with directed to 8 outputs ports. Remote control over TCP/IP enables pre-amplifier activation whereas overall nominal gain is 1dB at normal mode.

The performance is characterized by a low noise figure, high intermodulation products suppression and port to port isolation.

N-type RF input and SMA type output connectors, 19" professional compact housing provides ultimate EMI shielding.

Either the standard 18-36Vdc DC powering or 110/220VAC mains can be used for powering.

### Features

- Frequency range 20-500MHz,
- Single antenna RF inputs ports and 8 RF output ports,
- Pre-amplifiers are ON/OFF remotely switchable,
- 1dB nominal gain,
- Dynamic or static IP setting,
- MAC or IP address upgradable over RS232 port,
- Multitasking available at each individual 8 output ports,
- N type RF input and SMA type output connectors,
- D38999 class power and data ports,
- Surge and high ambient protection at each RF port,
- 18-36 VDC powering.



**Specifications**

Feature	Spec
<b>Frequency Range</b>	20 MHz - 500 MHz
<b>Number of Antenna Inputs</b>	1 (N type female)
<b>Number of Outputs</b>	8 (SMA type female )
<b>Operation Type</b>	Active or passive selectable
<b>Gain</b>	1 dB $\pm$ 1 dB
<b>OIP2 / OIP3</b>	min. 25 dB
<b>VSWR (Input / Output), 50 Ohm</b>	2.0 : 1 / 1.7:1
<b>Maximum Input Signal (CW)</b>	+13 dBm
<b>Power Supply</b>	18-36 VDC (6 pin D38999)
<b>Dimension</b>	W483 mm x D190 mm x H44 mm
<b>Remote Access</b>	13pin D38999 (Ethernet)
<b>Options</b>	230 VAC powering optional



## Overview

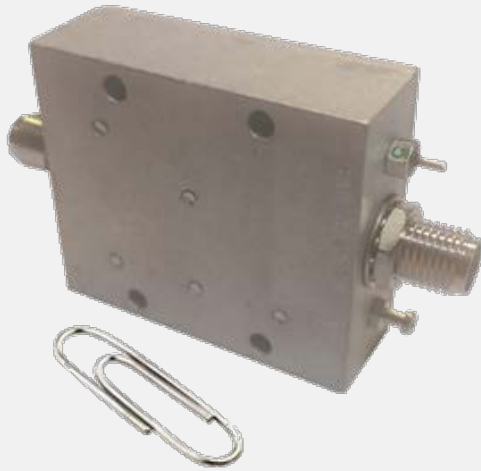
**DFAS3** series switching units are key component for Direction Finding (DF) systems.

DF systems are used to track and locate the source of any interfering signal. Basically DFAS3 unit is an antenna switching unit used in DF systems. The DF antennas are connected to the unit and with an external control; the antennas are switched to receivers.

The unit has calibration control capability in order to eliminate any deviations.

## Features

- Wide frequency range 20 MHz- 3 GHz,
- Control, bias and RF signal over mil-spec circular connectors,
- Shielding and effective grounding of EMI via Gel Rope gaskets,
- Sealing against water ingress,
- Compact design (97mm x 194mm x 72 mm).



## Features

- Models for cellular, GSM, LTE, GPS, Satellite, IF, RFID applications,
- Ideal for industrial or institutional and military RF systems,
- Connectorized models (SMA),
- Wide input supply voltage range for maximum application flexibility,
- Low Noise figure (NF) selection available, below 1dB,
- High Output Third Order Intercept point (OIP3) along with high gain,
- RoHS and REACH compliant.

## Overview

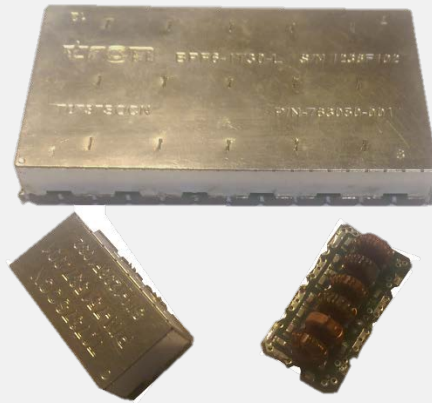
Tron's TRA series selection of amplifiers offer combination of gain, output power, and noise figure in compact connectorized packages with minimum size weight and power consumption.

Designed for 50 Ohm applications with SMA type coaxial connections, we are continuously expanding our product line with our strong engineering background to create low-cost, custom solutions for other specific requirements.

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## TRA Selection Guide

Product Code	Operating Voltage (V) /Current (mA)	Applications	Frequency Bandwidth (GHz)	Gain typ. (dB)	Gain Variation Over Band +/- (dB)	P1dB Avg. (dBm)	OIP3 Avg. (dBm)	NF typ. (dB)	VSWR (Input / Output)	Dimensions h x l x w (mm)
TRA-0314	5-18 / 40	Cellular, GSM, GPS, UMTS, wireless data, satellite, IF, WiMAX	0.01-3.00	15	1.3	11	12	3	1.90:1 / 1.90:1	13x35x30
TRA-0115	5-12 / 85	Cellular, GSM, UMTS, UHF RFID	0.05-1.00	15	0.7	23	37	1.5	1.90:1 / 1.90:1	13x35x30
TRA-0122	5-12 / 90	Cellular, GSM, UMTS, UHF RFID	0.05-1.00	22	5,0	20	35	0.6	1.40:1 / 1.40:1	13x35x30
TRA-0135	5-12 / 190	Cellular, GSM, UMTS, UHF RFID	0.05-1.00	35	3.0	19	32	1.5	1.90:1 / 1.90:1	30x80x65
TRA-1628	5-12 / 200	GPS, PCS, Military Radios	1.20-1.60	28	0.5	22	37	1.5	1.90:1 / 1.90:1	30x80x65
TRA-0330	5-12 / 170	LTE, WCDMA, Repeaters	0.5-3.00	30	2.0	19	33	4	1.90:1 / 1.90:1	30x80x65
TRA-0315	5-12 / 85	LTE, WCDMA, Repeaters	0.5-3.00	15	1.0	20	35	4	1.90:1 / 1.90:1	13x35x30



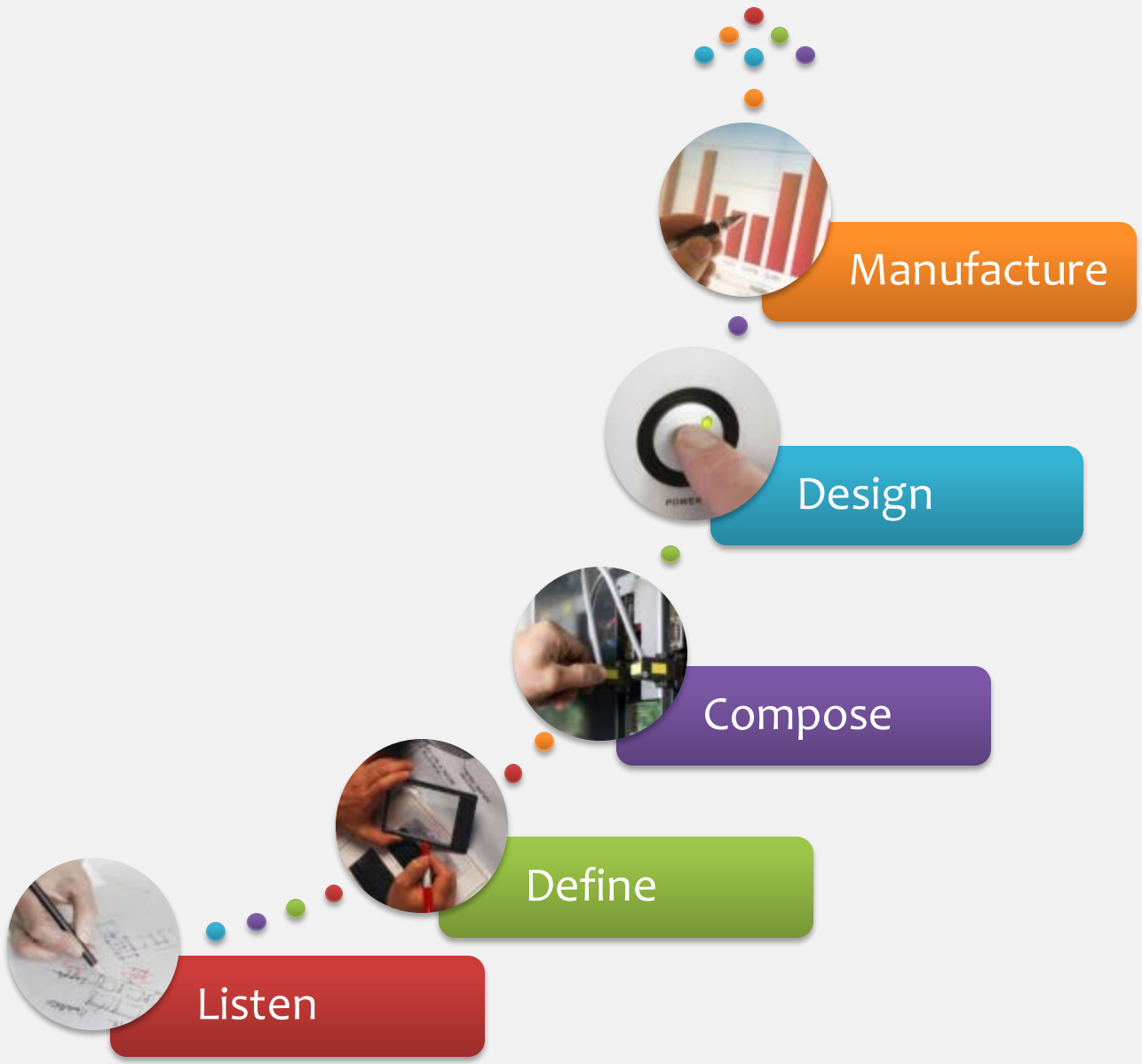
### Overview

**Lumped Element (LC) Filters** are built in LC tank circuit that consist of parallel or series inductors and capacitors. They are compact and optimized for high performance to achieve very high Q, low insertion loss and high efficiency. LC filters are available in band pass, low pass, high pass, band reject and high pass designs. Packaging options include surface mount, connectorized printed circuit board. Custom configurations can also be specified. Even though, there are ready-to-use designs, we also offer custom made solutions, providing challenging RF and mechanical properties.

**Filter Banks** are custom built for specific applications covering the frequency range of 1 to 300MHz, can be specified with 2 to 12 channels utilizing low profile discrete filters with minimum insertion loss and ultimate rejection properties. Packaging options include surface mount, connectorized printed circuit board. Custom configurations can also be specified.

### Features

- Topologies are offered in highpass, lowpass, bandpass, bandreject & multiplexer designs,
- Lumped component or ceramic design versions,
- Covers 1 MHz to 300 MHz frequency range,
- Standard 3 dB BW available from 3-15%,
- 3 dB BW also available up to 70% (Contact Factory),
- Digitally controlled, tunable custom design options,
- Filter banks for custom IF applications.



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