RFI
TECHNOLOGY SOLUTIONS

CEL-FI CERTIFIED
DISTRIBUTOR

# Cel-Fi In-Building Coverage Solutions

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# Cel-Fi In-Building Coverage

As your trusted distributor, RFI Technology Solutions has developed a catalogue to assist with Cel-Fi GO in-building coverage and system design.

## Commercial Complex Layout Diagram

**Cable**
Cable is used to connect donor and service antennas to the Cel-Fi GO unit.
Click here for range.

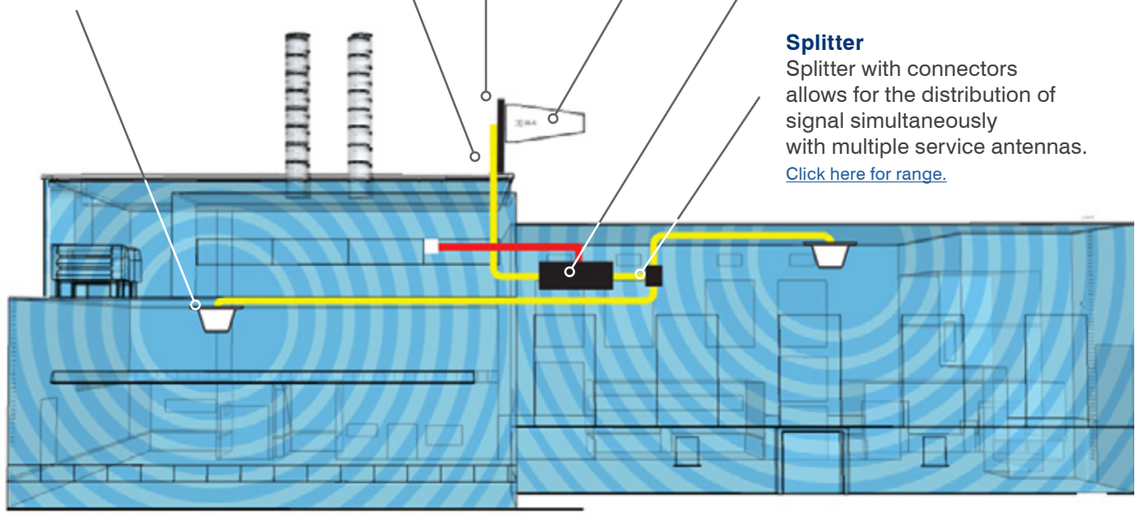
**Antenna Mount**
Outdoor mount secures donor antenna.
Click here for range.

**Donor Antenna (Outdoor)**
Donor antennas receive signal from carrier's radio tower and deliver signal to the Cel-Fi unit.
Click here for range.

**Service Antenna (Indoor)**
Service antennas go inside the buidling and distribute signal amplified by the Cel-Fi GO unit.
Click here for range.

**Cel-Fi**
Cel-Fi smart signal repeaters amplify and disburse mobile signal within a building. Each unit is carrier specific and locked to a set frequency band.
Click here for range.

**Splitter**
Splitter with connectors allows for the distribution of signal simultaneously with multiple service antennas.
Click here for range.





# About Cel-Fi Smart Signal Repeaters

Powered by Nextivity, Cel-Fi GO is a smart signal repeater that works to improve voice quality and data speeds.

Suitable for in-building coverage applications, Cel-Fi GO is an affordable, all-digital solution that provides high-quality cellular signal through a building.

Differing from standard indoor repeaters, Cel-Fi GO is network safe and does not interfere with the mobile network or other users

**Cel-Fi GO Smart Signal Repeaters has been tested, authorised and approved by the network providers.**

Telstra vodafone OPTUS

**Multi-band coverage solution**

**Approved for all Telco networks**

**Easy set up via WAVE app**

**Single and multi user capability**

**100dB system gain**

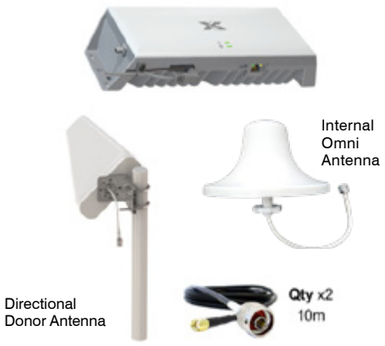
## Ideal solution for

Homes
Businesses
Commercial properties
Government buildings
Small manufacturing options
Rural areas

# Cel-Fi GO Stationary Range

Cel-Fi GO by Nextivity is the only mobile repeater product approved for use by all three operators in Australia. These are often referred to as Smart Repeaters due to their inherent design that eliminates any possibility of the unit causing inference on the mobile phone networks. There are variants to suit each operator and your RFI dealer can assist you in choosing the correct unit for your application.

CEL-FI GO G41




## Optus/Vodafone/Telstra Stationary

The JE version of the GO G41 can be switched to operate on any of the Australian Mobile Networks. The GO G41 can boost 3G and 4G simultaneously and is available in a few configurations. Other installation scenarios can be achieved bypurchasing the unit without antennas and then choosing from the list of components in this catalogue to make up a kit to suit your needs.

| Part number | Description |
|---|---|
| G41-JE-003 | Telstra, Optus, Vodafone GO-G41 Without antennas or cable |
| G41-JE-DL-1SO | Telstra, Optus, Vodafone GO-G41, 1 Directional Donor Antenna and 1 Internal Omni antenna with a 10M patch lead |
| G41-JE-DL-2SO | Telstra, Optus, Vodafone GO-G41, 1 Directional Donor Antenna and 2 Internal Omni antennas with a 1m, 5m and 10M patch lead plus a 2 Way Splitter |

CEL-FI GO G41

## Vodafone Stationary

The NE variant of the GO G41 is specific to the Vodafone network and cannot be switched to another operator. Choose from the list of components in this catalogue to make up a kit to suit your needs.

| Part number | Description |
|---|---|
| G41-NE-003 | Vodafone only - Cel-Fi GO G41, No Antennas |

## Remote Monitoring

The Go G41 has an Ethernet port to allow for remote monitoring/ configuration via the Cel-Fi Wave Portal.

| Part number | Description |
|---|---|
| MA-2080-B-KIT | Universal Hub - 4G LTE Modem Router With GPS |



CEL-FI GO G31


## Telstra Stationary

This GO G31 version will boost either 3G or 4G for the Telstra network and is available in a few configurations. Other installation scenarios can be achieved by purchasing the unit without antennas and then choosing from the list of components in this catalogue to make up a kit to suit your needs.

| Part number | Description |
|---|---|
| G31-3/5/28S | Telstra GO Stationary, Without antennas or cable |
| G31-3/5/28SK-DL-1SD | Telstra Stationary kit, 1 Directional Donor Antenna and 1 Internal Panel antenna with a 10M patch lead |
| G31-3/5/28SK-DL-1SO | Telstra Stationary kit, 1 Directional Donor Antenna and 1 Internal Omni antenna with a 10M patch lead |
| G31-3/5/28SK-DL-2SO | Telstra GO Stationary, 1 Directional Donor Antenna and 2 Internal Omni antennas with a 1m, 5m and 10M patch lead plus a 2 Way Splitter |
| G31-3/5/28SK-DO5-1SO | Telstra GO Stationary, 1 Omni Donor Antenna and 1 Internal Omni antenna with a 10M patch lead |

CEL-FI GO G31


## Optus Stationary

This GO G31 version will boost either 3G or 4G for the Optus network and is available in a few configurations. Other installation scenarios can be achieved by purchasing the unit without antennas and then choosing from the list of components in this catalogue to make up a kit to suit your needs.

| Part number | Description |
|---|---|
| G31-3/8/28S | Optus GO Stationary, Without antennas or cable |
| G31-3/8/28SK-DL-1SD | Optus Stationary kit, 1 Directional Donor Antenna and 1 Internal Panel antenna with a 10M patch lead |
| G31-3/8/28SK-DL-1SO | Optus Stationary kit, 1 Directional Donor Antenna and 1 Internal Omni antenna with a 10M patch lead |
| G31-3/8/28SK-DL-2SO | Optus GO Stationary, 1 Directional Donor Antenna and 2 Internal Omni antennas with a 1m, 5m and 10M patch lead plus a 2 Way Splitter |
| G31-3/8/28SK-DO5-1SO | Optus GO Stationary, 1 Omni Donor Antenna and 1 Internal Omni antenna with a 10M patch lead |

CEL-FI GO X

## Optus/Vodafone Stationary

The GOX can be switched between the Vodafone and Optus networks and it can boost 3G and 4G simultaneously. Choose from the list of components in this catalogue to make up a kit to suit your needs.

| Part number | Description |
|---|---|
| G32-1/3/5/7/8/20X | Optus/Vodafone GOX Stationary, Without antennas or cable |
| G32-1/3/5/7/8/20XSK-DL-1SO | Optus/Vodafone Stationary kit, 1 Directional Donor Antenna and 1 Internal Omni antenna with a 10M patch lead |

# Donor Antennas

A donor antenna is one that receives a signal from a carrier's radio tower (the donor). It delivers this signal to the in-building cellular repeater. This can be an omni directional or directional antenna.

Directional antennas generally provide a higher gain with a lower interference level. The drawback is that a directional antenna needs to be pointed in the right direction which will require some consideration.

A grid antenna is required where the signal to noise ratio is really bad. The high gain of a grid antenna coupled with its narrow beam width allows for a better donor signal. As a grid antenna has a very narrow beam width the antenna alignment plays an even more critical role which needs to be considered.

## Grid Antenna

This directional antenna is ideal for sites where it is difficult to get a good donor signal level/quality. It support all the 3G/4G/5G frequencies for the Australian networks. It is easy to install with clamp options available and it is lightweight yet durable design.

| Part number | Description |
|---|---|
| GM06-0738 | Grid antenna - 698-3800 MHz, Full Band, Low PIM, LTE/5G |

## Enclosed LPDA Directional Antenna

This wide-band directional antenna offers high gain and is suited to all Australian cellular networks. The unique ruggedized diecast aluminium construction ensures optimum performance and reliability in all weather and operating environments. The LPDA antenna is to be mounted vertically with tilting capability incorporated within the clamping arrangement. Mast mounting hardware is supplied to suite pole diameters of up to 60mm.

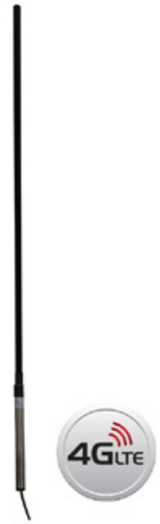
| Part number | Description |
|---|---|
| LPDA7030-11-10SMA | LTE LPDA Directional Antenna (698-3000MHz) 10.0m SMA(M) |
| LPDA7030-11-0.5NF | LTE LPDA Directional Antenna (698-3000MHz) 0.5m N(F) |



## Enclosed Log Periodic Directional Antenna

This high performance wide band directional antenna is designed to operate in the 3G/4G/5G bands in Australia. This wideband design eliminates the need to purchase different antennas for each frequency and also means that this model is 5G ready. The brass & aluminium internal components of this antenna are enclosed within a UV-stable white ABS radome for all-weather operation and is supplied with a tilt and swivel mast mount kit.

| Part number | Description |
|---|---|
| LPDA7040-11-0.3NF | Enclosed Log Periodic Directional Antenna 698-4000MHz (0.3m RG141 / N type female) |




## LTE Cellular Base Antenna

This is an ideal donor antenna where a directional antenna cannot be used and the secret to its outstanding performance lies in the use of the patented Meander™ radiating elements. These Meander™ circuits are coupled together to deliver extraordinary consistency in gain, coverage pattern and bandwidth. The result is a unique antenna able to operate across all mobile phone networks globally, housed in the one unit.

| Part number | Description |
|---|---|
| COL7195-SMA | LTE 6.5dBi Collinear Antenna (698-2700 MHz) 10m SMA(M) |
| COL7199-SMA | LTE 8.5dBi Collinear Antenna (698-2700MHz) 10.0m SMA(M) |

## RFI Low Band Yagi – 700-890MHz

The YW15-6989 is a high gain yagi antenna which provides excellent point to point communications in RF control, short or long haul link, point to multipoint and other applications calling for highly directional antennas. This model particularly suits cellular 700MHz 4G and 800MHz 3G applications.

| Part number | Description |
|---|---|
| YW15-6989 | 15 Element Yagi 698-890MHz |

# Service Antennas

Choose from our range of omni directional or directional antennas to suit your installation.

Installing a coverage antenna can be a challenge inside a building where access to ceiling space etc is complicated. There are a few options when it comes to a coverage antenna, and this depends on the area that needs to be covered along with access. Omni antennas are generally good as they provide coverage 360 degrees around the antenna and is best placed in the center of the area requiring coverage. The options here are ceiling mount style antennas or the alternative is a wall mounted compact omni like the CSM500 or a magnetic mount antenna that can be placed on any flat surface.

Panel antennas are directional which means they provide coverage in the area in front of the antenna. These generally have higher gain than an Omni which means a larger coverage bubble in front of the antenna. They are best placed on a side wall pointing towards the area where coverage is required and can be easier to plan/install than a ceiling mounted omni.

## Ultra-Compact Omni-directional LTE Antenna

The CSM500 is an ultra-compact omnidirectional 4G LTE antenna that provides excellent coverage for mobile applications from 698 MHz to 2.7 GHz. Combine with CSM500-PWMB for easy mounting against a wall.

| Part number | Description |
|---|---|
| CSM500-5M-SMA | Ultra Compact Antenna (698-2700 MHz); 5m SMA(M) |
| CSM500-PWMB | CSM500 Series Wall Mounting Bracket; Plastic - Black |
| CSM700-5M-SMA | **Compact Antenna (698-3800MHz); 5.0m SMA(M)** |

## LTE Magnetic Base Antenna

The LTE-MAGS magnetic cellular antenna delivers stable, omni-directional gain across all common 3G, 4G cellular bands from 698 MHz to 2.7 GHz. Ideal for installations where traditional omni/panel antennas cannot be mounted, this antenna can be stuck on a metal surface like a filling cabinet or just placed on a shelf.

| Part number | Description |
|---|---|
| LTE-MAGS-3M-SMA | RFI LTE Magnetic Base Antenna (698-2700MHz) 3m SMA(M) |



## SISO Omni

The DAS6938-SOC150-N is a high quality indoor Omni-directional antenna, covering 3G, 4G &5G Cellular bands, 689-960 MHz, 1710-3800 MHz. The DAS3827LP-SOC150-N is a low profile version to reduce the aesthetic impact. These are ceiling mounted antennas and this needs to be considered when planning the installation.

| Part number | Description |
|---|---|
| DAS6938-SOC150-N | SISO Omni 698-3800, N type |
| DAS3827LP-SOC150-N | LTE Low Profile Omni-Directional Ceiling Antenna - 380-520MHz & 698-2700MH |

## SISO Panel

These panel antennas are high quality indoor/outdoor SISO directional antennas, covering 3G, 4G &5G Cellular bands, 689-960 MHz, 1710-2700MHz & 3300-3800 MHz. Combine it with an appropriate cable from the cable section below to suit your installation.

| Part number | Description |
|---|---|
| DAS6938-SDP150-N | SISO Panel 698-3800, N type |
| CPL6938-10M-N-SMA | 5G LTE SISO Directional Panel Antenna (698-3800MHz); 10.0m SMA(M) |

## MIMO Panel

The DAS6927O-MDP153 is a PIM rated MIMO Outdoor directional panel antenna, covering LTE Cellular bands, 689-960 MHz & 1710-2700 MHz. This multi-band design eliminates the need to purchase different antennas for each frequency and is ideal for all fixed in-building coverage applications. The MIMO (multiple in multiple out) design enhances data throughput even under conditions of interference, signal fading, and multi-path

| Part number | Description |
|---|---|
| DAS6927O-MDP153 | Low PIM MIMO Outdoor Directional Panel Antenna - 698-960MHz&1710-2700Mhz, 4.3-10 |

# Cable and Cable Assemblies

Cables connect the Cel-Fi device to the antennas and it is important to choose the correct cable for your installation. Note that the Cel-Fi has SMA female connectors and this needs to be considered when choosing your cables. Factors to consider are:

**Cable path length** – it is important to understand that there are RF losses in cables which means that longer cable runs will have higher losses.

**Cable size** – This is a tricky topic, as the tendency is to use smaller more flexible cable for easier installation but this generally means higher RF losses. It is important to find a balance here between ease of installation and system performance.

For short cable runs, typically under 10M it is acceptable to use the 9006 cable (this is a low loss RG58 style cable).

For medium cable runs ie, 10-25M it is recommended to use CNT400 to minimize the losses.

For longer cable runs longer than 25m it is generally recommended to use a lower loss cable like the Commscope LDF4-50. Note that this cable is a bit more rigid and thus more complex to work with and it also needs a person with skills to fit the connectors.

LDF4-50A

CNT-400

## Coaxial Cable / Tools

| Part number | Description |
|---|---|
| LDF4-50A | Commscope Heliax 1/2” Cables |
| CNT-400 | Commscope CNT-400 50 Ohm Braided Coaxial Cable - Black PE Jacket |
| MCPT-L4 | Commscope Easiax Plus Autmated Cable Prep Tool for 1/2” Cable |

92-01EZ-0.5

92-01EY-0.6

## Cable Lead Special Purpose

| Part number | Description |
|---|---|
| 92-01EZ-0.5 | RFI Cable Lead Right Angle QMA(M) to 4.3-10(M); 0.5m RG223 Cable |
| 92-01EY-0.6 | RFI Cable Lead SMA(M) to 4.3-10(M); 0.6m RG223 Cable |



Cable Lead
N(M) to N(M)

## Cable Lead N(M) to N(M)

| Part number | Description |
|---|---|
| 92-07D-5 | RFI Cable Lead N(M) to N(M); 5m 9006 Cable |
| 92-07D-10 | RFI Cable Lead N(M) to N(M); 10m 9006 Cable |
| 92-09D-10 | RFI Cable Lead N(M) to N(M); 10m CNT400 Cable |
| 9207N-15 | RFI Cable Lead N(M) to N(M); 15m CNT400 Cable |
| 92-09D-20 | RFI Cable Lead N(M) to N(M); 20m CNT400 Cable |
| 92-09D-25 | RFI Cable Lead N(M) to N(M); 25m CNT400 Cable |

Cable Lead
SMA (M) to N(M)

## Cable Lead SMA(M) to N(M)

| Part number | Description |
|---|---|
| 9207N-0.5 | Pulse Cable Lead SMA(M) to N(M); 0.5m 9006 Cable |
| 9207N-1 | Pulse Cable Lead SMA(M) to N(M); 1m 9006 Cable |
| 9207N-3 | Pulse Cable Lead SMA(M) to N(M); 3m 9006 Cable |
| 9207N-5 | Pulse Cable Lead SMA(M) to N(M); 5m 9006 Cable |
| 9207N-10 | Pulse Cable Lead SMA(M) to N(M); 10m 9006 Cable |
| 9207N-15 | Pulse Cable Lead SMA(M) to N(M); 15m 9006 Cable |

# Passive Devices

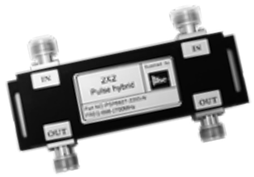
It is possible to split the signal to multiple service antennas thus enabling the coverage to be extended to more than one area in a building . It is also possible to combine multiple Cel-Fi devices on one antenna system if required.

When combining Cel-Fi devices it is important to use combiners with high port isolation, these are referred to as Wilkinson style splitter/combiners, see the PSP6927-220x and PSP 6927-530X series.

**It is important to note that it is not allowed to use Band 5 (850MHz) and Band 8 (900MHz) on the same antenna system when combining multiple Cel-Fi devices.**

When installing multiple antennas from one Cel-Fi device it is good practice to try and balance the RF power to each antenna.

If the cable to each antenna is of similar length a simple 2/3 way splitter can be used, see PSP6927-510X. If there is a significant difference between the cable lengths to the antennas it might be better to use a directional coupler, this will allow more power to go to the antenna on the longer cable, see PSP6927-23XX.



2x2

4x4

## Hybrid Combiners

Pulse Hybrid Couplers covers all cellular bands from 698-2700MHz with a low passive Inter-Modulation, and both 2x2 and 4x4 options available. Typically used to combine either in-band carriers or carriers across multiple bands.

| Part number | Description |
|---|---|
| PSP6927-2203-N | 2x2 Hybrid Combiners N(F) |
| PSP6927-2206-N | 4x4Hybrid Combiners N(F) |

2 way 3 way

4 way

## W Splitter/Combiner

These devices have high isolation between the output ports which is required when combining multiple Cel-Fi devices.

| Part number | Description |
|---|---|
| PSP6927-5302-N | W Splitter/Combiner, 2 way, 698-2700 N(F) |
| PSP6927-5303-N | W Splitter/Combiner, 3 way, 698-2700 N(F) |
| PSP6927-5304-N | W Splitter/Combiner, 4 way, 698-2700 N(F) |



2 way 3 way 4 way

## Power Divider

Pulse Power Dividers are designed to split RF source power into an equal ratio of power outputs. Ideal to use where multiple antennas are connected to a Cel-Fi device at a similar distances from the Cel-Fi.

| Part number | Description |
|---|---|
| PSP6927-5102-N | Power Divider, N type, 2 way, 698-2700, -150dBc N(F) |
| PSP6927-5103-N | Power Divider, N type, 3 way, 698-2700, -150dBc N(F) |
| PSP6927-5104-N | Power Divider, N type, 4 way, 698-2700, -150dBc N(F) |

6dB

10dB

## Directional Coupler

Directional couplers are designed to split RF source power into an unequal ratio of power outputs. Ideal to use where multiple antennas are connected to a Cel-Fi device at a different distances from the Cel-Fi.

| Part number | Description |
|---|---|
| PSP6927-2306-N | 6dB Directional Coupler N(F) |
| PSP6927-2310-N | 10dB Directional Coupler N(F) |

SP0000-6002-12

## Other

| Part number | Description |
|---|---|
| SP0000-6002-12 | Terminator 50Ohm 2W N(M) |
| GT-NFF-AL | Lightning Arrestors |

# Adaptors/Connectors

RFI stock a full range of connectors and adaptors to enable your installation.

L4TNM-PSA

L4TNF-PSA

## Commscope Connectors

| Part number | Description |
|---|---|
| L4TNM-PSA | Commscope N(M) Connectors LDF4-50A 1/2' Cable |
| L4TNF-PSA | Commscope N(F) Connectors LDF4-50A 1/2' Cable |
| L4HM-D | Commscope 4.3-10(M) Connector for LDF4-50A 1/2' Cable |

D43-131

D43-131

D43-111

D43-112

## Pulse Connectors

| Part number | Description |
|---|---|
| D43-131 | Pulse 4.3-10 Male Connector for RG58 Cable |
| D43-132 | Pulse 4.3-10 Female Connector for RG58 Cable |
| D43-111 | Pulse 4.3-10 Male Connector for CNT400/LMR400/ RG8 Cable |
| D43-112 | Pulse 4.3-10 Female Connector for CNT400/LMR400/ RG8 Cable |
| N-89 | Pulse N(M) Connector for RG58 Cable |
| SMA-01 | SMA(M) Connector for RG58 Solder/Crimp |



N-200

N-201

N-252

## Pulse Connectors

| Part number | Description |
|---|---|
| N-200 | Pulse N(F) Connector for CNT400 Cable |
| N-201 | Pulse N(M) Connector for CNT400 Cable |
| N-87H | Pulse N(M) Connector for RG142/223 Cable |

A-93

A-74

A43-102

## Pulse Adaptors

| Part number | Description |
|---|---|
| A-93 | Pulse SMA(F) TO N(M) Inter series adaptor |
| A-74 | Pulse Adaptor - SMA Male to N Female |
| A43-102 | Pulse 4.3-10 Male to N Female Adaptor |
| N-246 | Pulse N(M) To N(F) Right Angle Adaptor |

# Antenna Mounting Hardware

RFI stock a range of antenna mounting options.

## Mast

| Part number | Description |
|---|---|
| MST4.5-HD | Steel Mast; 15’ x 1.5: (4.57M x 3.17CM) |
| DRL3 | Duralium Scaffold; 3m X2202 6061T6 Milled Finish |
| DRL6 | Duralium Scaffold; 6m X2202 6061T6 Milled Finish |

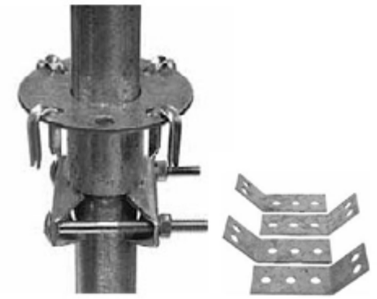
R1031

WF12

## Mounting Hardware

| Part number | Description |
|---|---|
| WF12 | 12” Wall standoff mount (305MM) |
| HS72 | Hockey stick mount 1.8M (70.87”) |
| R1031 | Stramit roof mount |
| R1022 | Matchmaster Right Angle Roof Mount |
| R1013 | Matchmaster Hockey Stick Stay Bars; 4” (1.2m) - Pair |
| R1014 | Matchmaster Hockey Stick Stay Bars; 6’ (1.8m) - Pair |
| R1015 | Matchmaster Hockey Stick Stay Bars; 8” (2.5m) - Pair |





R1009



R1008-4

R1001

## Guy Wire Kits

| Part number | Description |
|---|---|
| R1009 | Guy clamp assemblies for 1.5” (3.81CM) mast |
| R1008-4 | Guy cleat surface anchor- pack of 4 |
| R1001 | Guy wire Galvanised 180M coil, 7 X 0.90 |
| R1017-PK | Wire rope grips (PACK OF 8) |
| R1006 | Turnbuckle hook & eye (7.9mm) - PACK OF 4 |

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