

Mynaric

Technology
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Terminals coming off production line

Mynaric's manufacturing facility has started to produce communications terminals which can transmit data via laser between moving airborne or space platforms at rates similar to conventional optical fibre, but with the light transmitted through free space rather than along a cable. It aims to be the first company to offer laser communications terminals in the volumes and at the price point required by communications systems such as those being developed by Amazon, Telesat and SpaceX.

Product available for pathfinder missions and beyond

Mynaric's growth trajectory appears relatively unaffected by the coronavirus pandemic. It is producing pre-series volumes of airborne terminals which will be used by customers in trials from Q320 onwards. Initial volumes of space terminals are going through the final test and qualification phase, with delivery of the first units to customers scheduled for H220. While details of these customers have not been disclosed, in October 2019 Mynaric announced an initial contract to supply multiple terminals valued at €1.7m for a product validation mission. This was followed in January by a multi-million-euro contract from a different customer to supply terminals for deployment on another product validation mission.

Investment for commercial deliveries

Total operating performance (which includes capitalised development) during FY19 was €7.9m. This was 26% higher than FY18 as development work on space and airborne terminals intensified. Losses after tax were stable year-on-year at €7.8m. Net cash (there is no debt) reduced by €4.0m during FY19 to €8.9m at the year-end. Investment of c €6m in terminal development, and c €2m in production and test equipment for a new, larger facility was offset by €10.4m (net) raised from the issue of shares at €55/share to a lead investor in a Low Earth Orbit (LEO) satellite constellation in March 2019. In February 2020, Mynaric raised another €12.3m (gross) through a substantially oversubscribed private placement at €42.50/share.

Valuation: Analysis of potential revenue

Since Mynaric is not expected to start delivering commercial units until H220 and generate an operating profit until FY21, we present a scenario analysis rather than a peer group comparison of multiples. This analysis shows that a constellation of 100 LEO satellites could require €75m of Mynaric's terminals and a cluster of 250 airborne communications platforms could require €113m of equipment.

Consensus estimates

Year end	Revenue (€m)	EBITDA (€m)	EBIT (€m)	PAT (€m)	DPS (€)	P/E (x)
12/18*	1.4	(7.4)	(7.8)	(7.8)	0.0	N/A
12/19	0.4	(6.5)	(7.7)	(7.8)	0.0	N/A
12/20e	5.2	(8.9)	(10.6)	(11.2)	0.0	N/A
12/21e	48.4	3.0	(0.7)	(1.8)	0.0	N/A

Source: Hauck & Aufhauser and Kepler Cheuvreux. Note: *Restated.

Price €45.9
Market cap €147m

Share price graph



Share details

Code	MOY
Listing	Deutsche Börse Scale
Shares in issue	3.2m
Last reported net cash as at end Dec 2019 (excluding €6.7m lease liabilities)	€8.9m

Business description

Mynaric designs and manufactures laser communication terminals and ground stations for airborne and spaceborne networks and applications. Its objective is to become the world's leading provider of network equipment for the aerospace communication industry using its serially produced and low-cost laser communication products.

Bull

- Wireless laser technology gives faster data rates than conventional microwave transmission.
- Wireless laser technology potentially brings internet connectivity to remote regions without installing fibre optic cable.
- Tech is cost effective for mega-constellations.

Bear

- Technology not proven in complete satellite or airborne communications networks yet.
- Rate of commercial roll-out dependent on network operators securing funding.
- Limited number of potential network operators to which it can sell equipment.

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FY19 technical and commercial progress

Although Mynaric has transitioned from a technology company delivering one-off prototypes to manufacturing pre-series products suitable for multiple customers, it is still at the stage where technical and commercial progress are more important than financial metrics.

Products available for pathfinder missions and beyond

In October 2019, Mynaric released the first public description of its product portfolio for the commercial laser communications market. At that time, the ground stations for both satellite and stratospheric applications were available. Since then the company has manufactured the initial pre-series volumes of the HAWK AIR airborne terminal, which will be used by customers from Q320 onwards to assess the equipment and refine their requirements. Initial volumes of the CONDOR space terminals are going through the final test and qualification phase, with delivery of the first units to customers scheduled for H220. The ability to supply terminals at the same time as potential customers are launching their initial pathfinder missions positions Mynaric as a key supplier to the mega-constellations of satellites and aerial platforms under development.

Exhibit 1: Product portfolio

Product	Function	Status
HAWK AIR	Terminal for air operations	Unveiled at Paris Air Show in July 2019. Available now.
HAWK SPACE	Terminal for inter-satellite and satellite-to-ground operations	Details to be disclosed. Will be based on HAWK AIR platform, but tailored to needs of specific mega-constellations. Potentially available by end 2020.
CONDOR	Inter-satellite operations	Preliminary stages of production commenced. Available for launch on-satellite H220.
RHINO	Ground terminal for satellite operations	Available now.
ARMADILLO	Ground terminal for air operations	Available now.

Source: Company data

Expanding serial production to meet anticipated demand

In May 2019, Mynaric moved to larger, customised premises just outside Munich. These house a clean room, laboratories, R&D facilities and test equipment to support serial production. This includes a link testbed to simulate launches and the extreme conditions experienced in space. Serial production is critical because it enables Mynaric to meet the cost and volume requirements for mega-constellations. It sets Mynaric apart from the competition since, as far as management is aware, it currently has more CONDOR space terminals and HAWK AIR flight terminals in its production schedule (over 30 units) than have ever been launched by all of its commercial competitors combined. Now that the first HAWK AIR terminals have been completed, the company is refining its production line processes and procedures to ensure it is able to cope with multi-unit demand in future.

First contracts for terminals on satellite pathfinder missions

In October 2019, Mynaric announced that it was going to deliver multiple laser communication flight terminals under an initial contract valued at €1.7m for a product validation mission. This will be the first launch of its complete satellite terminal into space and is scheduled for H220. The name of the customer has not been disclosed. This was followed in January by a multi-million-euro contract from another, also undisclosed, space customer. This second contract is also for terminals for deployment as part of a product validation. These contracts confirm market demand for Mynaric's cost-effective product for laser communication between satellites in mega-constellations. If these product validation missions are successful, Mynaric could potentially generate substantially more business from these customers.

FY19 financials

Switch from project work to preparing for commercial deliveries

The German accounting metric 'total operating performance' is more significant than revenue for Mynaric at its stage of evolution, as it includes the value of the increase in finished goods and work in progress, and the amount of development activity on projects that are not linked to specific customer contracts. The total during FY19 was €7.9m. This was 26% higher than FY18. Moreover, the breakdown is different and demonstrates the switch from project-based work to preparation for commercial sales. FY18 had much higher revenues than FY19 because it benefited from milestone payments on delivery of the first optical ground station. H119 has higher levels of capitalised work than H118, reflecting intensified development work on spaceborne and airborne terminals.

Exhibit 2: Analysis of total operating performance

	FY19	FY18 restated	Notes
Sales revenues (€m)	0.4	1.4	FY18 includes final milestone payments for the first optical ground station that was delivered in the summer.
(Decrease)/increase in finished goods and work-in-progress (€m)	0.6	1.4	Primarily attributable to optical ground stations and air terminals in production in FY19, optical ground stations only in FY18.
Other own work capitalised (€m)	6.2	3.2	Cost of development activity on projects that are not linked to customer contracts. FY19 increase reflects pre-production activity.
Other operating income (€m)	0.7	0.4	
Total operating performance (€m)	7.9	6.3	

Source: Company data

Cost of materials was 6% higher than the previous year, with a substantial increase in Q4 as production intensified. Personnel costs rose by 14% year-on-year as the total number of employees increased from an average of 73 during FY18 to an average of 82 during FY19. This reflects the transition to serial production, with additional employees in test, production, logistics, procurement and quality control. Other operating expenses decreased by 11% because of the transition to IFRS 16 in 2019, which no longer treats lease payments on the new building near Munich as operating expenses. Losses after tax were the same as the prior year at €7.8m.

Lead investor in satellite constellations providing finance

Net cash reduced by €4.0m during FY19 to €8.9m (excluding €6.7m IFRS 16 lease liabilities) at the period end. In addition to €7.4m cash consumed in operations, the company invested €6.1m in intangible assets, primarily the capitalised costs of developing the CONDOR and HAWK AIR terminals, and €2.0m in fixed assets, most of which related to production and test equipment for the new facility, which is rented. In March 2019, Mynaric raised c €10.4m (net) through the issue of shares at €55/share to the lead investor of a satellite constellation with which it continues to work on the provision of spaceborne terminals for several satellites forming a demonstration mission. In February 2020, Mynaric raised €12.3m (gross) through a private placement, which was substantially oversubscribed, at €42.50/share. The recent funding is being used to increase production capabilities, to accelerate customer acquisition, particularly in the US, and to secure and strengthen Mynaric's market position by investing in advanced developments underpinning next-generation technologies.

Outlook: Faster 'internet-in-the-sky'

Coronavirus pandemic has negligible impact on Mynaric so far

As of early May, when the FY19 report was published, the global COVID-19 pandemic has had a negligible effect on the day-to-day operation of Mynaric. The pandemic does not appear to have had any material impact on potential customers' plans for launching satellite constellations. If anything, the pandemic has highlighted the importance of providing broadband-quality

communications to people across the globe, including those in remote or rural locations where it is not economically practical to provide terrestrial optical communications networks. For these people, provision of broadband via a satellite-based or airborne-based optical communications networks represents a viable alternative. This topic is explored in more detail in a [recent interview with Bulent Altan](#), a member of Mynaric's executive board and SpaceX veteran.

FY20 goals

Mynaric's engineering team is spending H120 putting the CONDOR flight terminal for inter-satellite linking through final product testing ahead of delivery to customers later in the year. From Q320 onwards, Mynaric will be supporting customers trialling airborne terminals. In parallel, the company is pursuing additional contracts to deliver terminals for satellite pathfinder missions. Mynaric has begun to develop laser communication solutions that incorporate electronics sourced solely from within the US, which will be attractive for domestic customers, especially those working on government projects. The availability of terminals is timely because of the recent acceleration of activity in the space communications sector. For example, SpaceX has launched 420 satellites out of a total of nearly 12,000 into low earth orbit, Amazon has asked the US Federal Communications Commission to expedite its request to launch over 3,000 communication satellites and the US Space Development Agency has issued a request for proposals for a high-speed government satellite network.

Valuation

In common with most stocks, Mynaric's share price has been very volatile this year, falling from €61.8m in early February to €28.3 in mid-March as investors panicked about the impact of COVID-19, then partially recovering as investors realised that not all companies will be significantly affected by the pandemic. At the current level, the share price is similar to what it was a year ago but is still 15% below the €54.0/share price at the IPO in October 2017.

Exhibit 3: Analysis of potential revenues

Internet LEO system				
Cost of payload* (€m)	2.0	1.5	1.0	0.75
% payload composed of Mynaric systems	50%	50%	50%	50%
Number of satellites in constellation	50	100	300	1000
Revenues attributable to Mynaric (€m)	50	75	150	375
UAV, aircraft, balloon-based system				
Cost of payload (€m)	1.00	0.90	0.68	0.51
% payload composed of Mynaric systems	50%	50%	50%	50%
Number of platforms in constellation/cluster	50	250	500	1000
Revenues attributable to Mynaric (€m)	25	113	169	253

Source: Edison Investment Research. Note: *Payload is the part carrying out the communications or sensing function.

Mynaric is still at the pre-commercial phase and is not expected to generate operating profit until FY21. This limits the value of any analysis based on peer multiples, which do not ascribe any value for the substantial growth that may be realised from the potential deployment of terminals on mega-constellations such as those planned by Amazon and SpaceX. Rather than using a comparison with peer multiples, we continue to present a scenario analysis (Exhibit 3) showing potential revenues achievable if the technology is deployed in communication systems of different sizes. We split the analysis into two types of system. The first looks at communication networks based on smaller LEO satellites, which typically have more than 100 satellites each. The second looks at communication networks based on many more, less expensive platforms, which may be unmanned aerial vehicles (UAVs), aircraft or balloons. A communications satellite has space-qualified terminals, which are more expensive than those on an airborne platform.

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