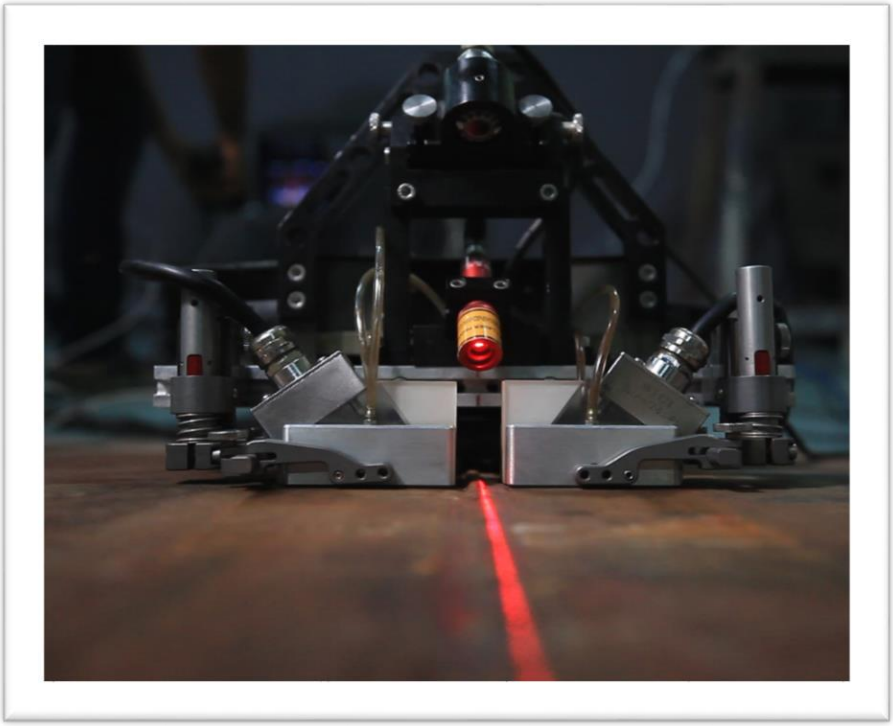


ROBOTIC CRAWLER FOR WELD INSPECTION

DHVANI RESEARCH
Making Technology Work

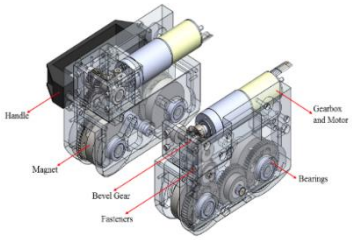
Welding quality evaluation is a very important process in all manufacturing industries. This process should be performed by qualified technicians and approved hardware.

The inspection of the weldments can be done manually using any one of the NDE techniques. Manual implementation results in a lack of accuracy and repeatability, which are more time-consuming. We can improve on these aspects by using an automated crawler.

The Robotic Crawler is a modular steerable scanner that can scan any contoured surface. The crawler is manufactured from lightweight durable Aluminum. The scanner assembly allows perfect wheel contact to a flat or curved surface using its dual motor-powered magnetic wheels. The magnetic wheels which help the scanner move on any surface are steered using a handheld controller. The modular assembly ensures that a crawler is an ideal tool for remote access corrosion mapping or weld inspection utilizing pulse echo, phased array, TFM-FMC, and TOFD technologies.

The system is equipped with standard accessories like a vision system with DVR for remote visual monitoring applications, a laser guideline for weld tracking which is visible in any lighting conditions, and an advanced weld tracker which automatically tracks the weld.

Custom Modular Design



The system can be packaged in multiple configurations with or without ultrasound units. The handheld pendant also comes in different offerings with a dynamic lightweight touchscreen pendant having custom features as per customer requirements to a simple forward, reverse, left, and right button configuration.

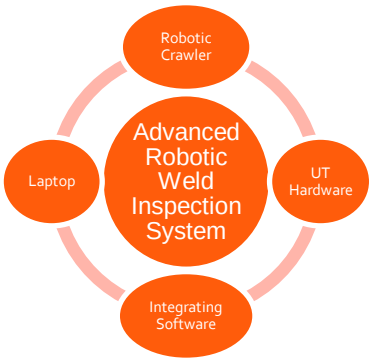
Crawler on a curved plate

The advanced option with a complete setup for carrying out a weld inspection using the TFM/FMC method consists of the robotic crawler, probe holders for phased array probe, line laser for weld tracking, vision system with a recorder for visual inspection and weld tracking, irrigation system for couplant supply to the wedges, portable water storage, phased array probes, wedges, Advanced TFM/FMC capable PAUT instrument, acquisition software, visualization/reporting software, ADR plugin, and laptop.

Advanced robotic weld inspection package

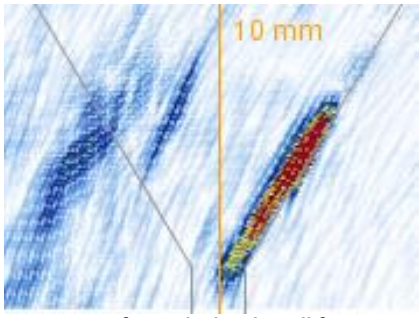
The packaging is also customizable with the standard option coming in three boxes with all the above-said components.

The standard option also includes an encoder output option in case the customer wants to use any other UT instruments. The standard option requires a 230 V AC as input to the control panel but an optional DC-powered system running on low voltages can be provided on demand.

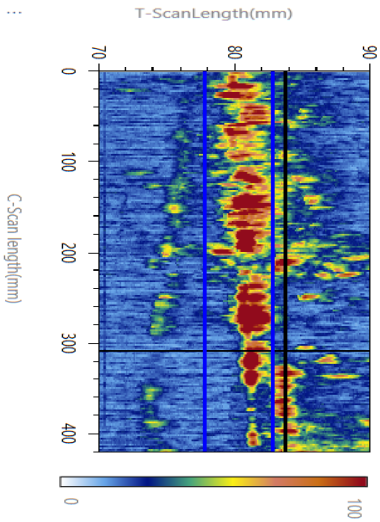


The optional accessories include but are not limited to a third axis for C scan mapping of the wall thickness, corrosion, wall thinning, etc., battery pack with charger, laser surface mapping, additional magnetic support for balancing more payload if any on vertical surfaces, custom made to length armored/jacketed cables, made to order connectors on the control panel, thermal imaging, etc.

Data collected



A TFM frame lack sidewall fusion collected by the robot

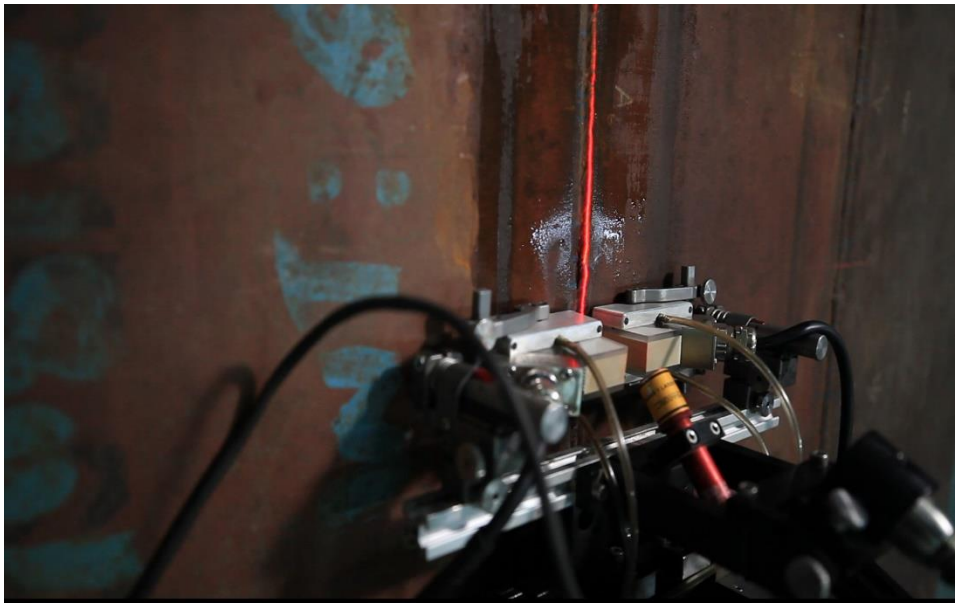


Collected C Scan

Robotic Crawler for Weld Inspection

A Dhvani Research Application Note

Chennai, INDIA



Inspection system on sample

For more information, please contact:

info@dhvani-research.com

+91-44-6646-9880

No.10 Veeramamunivar street,
C.B.I Colony 2nd main Road,
Kandanchavadi, Chennai 600096 - India.

DHVANI RESEARCH
Making Technology Work