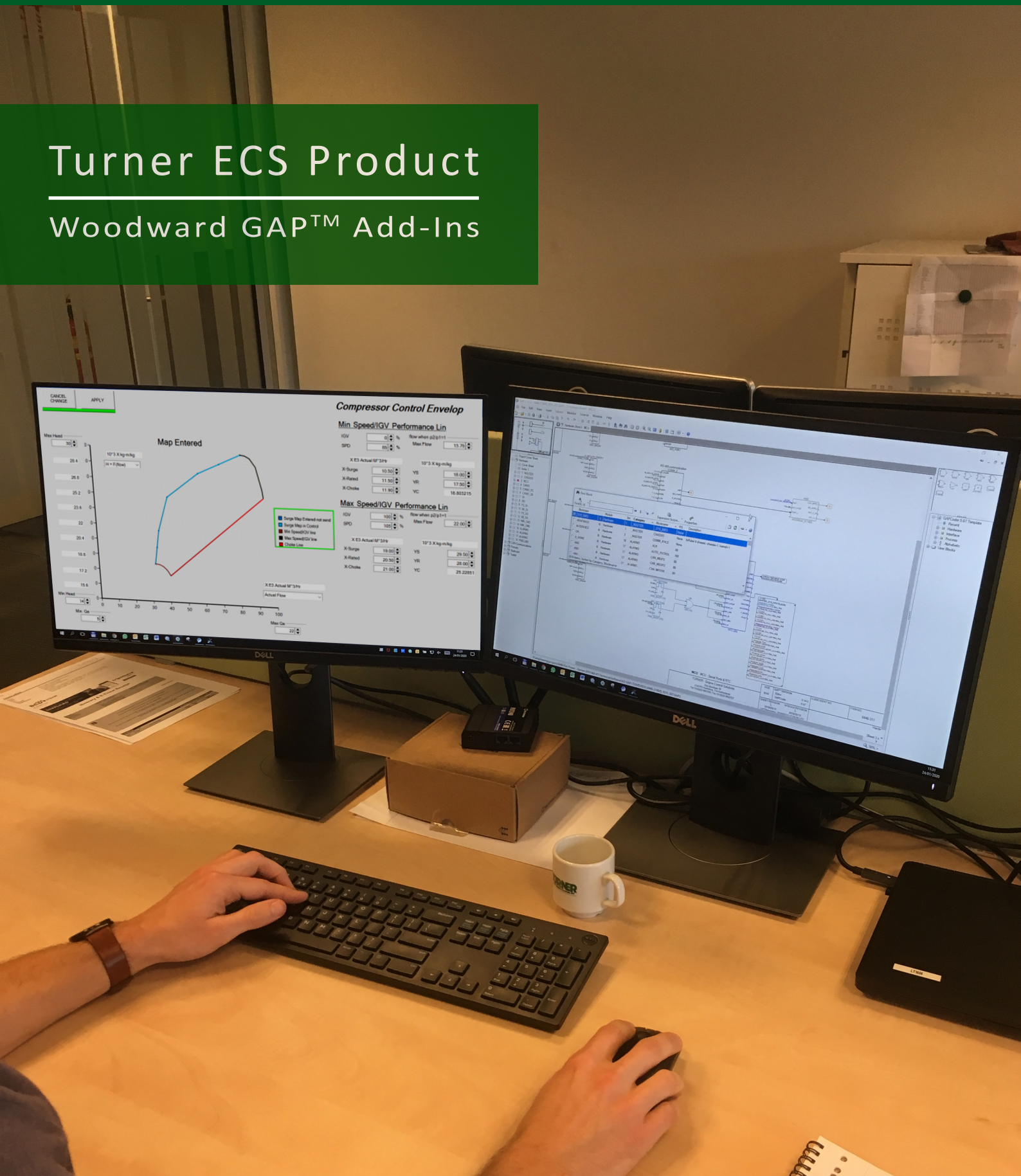


January 2020

Turner ECS Product Woodward GAP™ Add-Ins



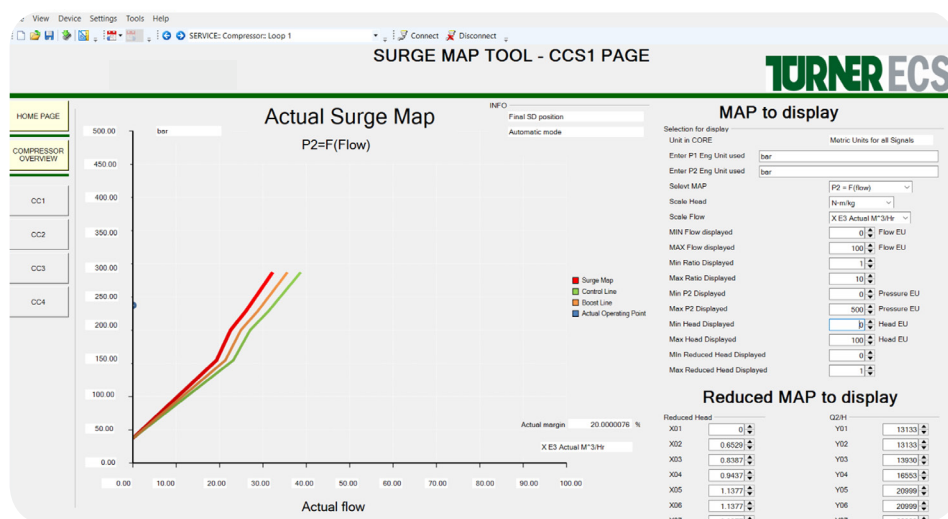
Introduction

For many GAP applications running in the field today it is not possible to display the steam map, surge map or start up curves. In addition, often the alarm annunciation is not compatible with OPC communication meaning descriptions and time stamps are not transferred. Many of these applications are written using older GAP versions and are in need of upgrades.

Even if Turner ECS has modern standard software libraries that could be a perfect solution for these upgrades, most customers are reluctant to modify too deeply their application which has been running for many years without major issues.

That being said, often customers regret not having modern interfacing and visualization tools but consider the risk of upgrading too high, regardless of any guarantees and warranty given.

A solution, called add-ins, has now been developed by Turner ECS which complies with the requirements of conservation of existing functionality while at the same time fulfilling the need of advanced modern interfacing.



OUR GAP ADD-INS SATISFY THE FOLLOWING CUSTOMER REQUIREMENTS:

- No functionality changes
- Display desired information
- Improves the functionality of the application
- Safe to use

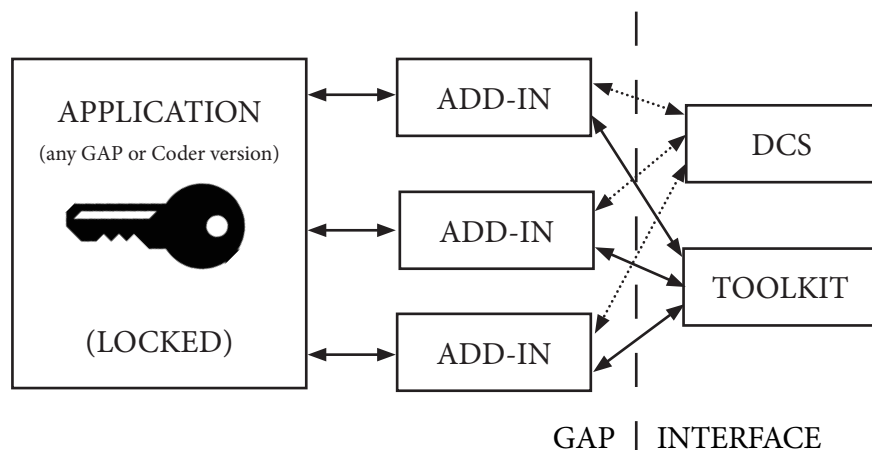
KEY FEATURES

- Display dynamic:
 - Surge map
 - Steam map
 - Startup curve
- Advance compressor performance monitoring function
- Data can be reached by DCS over Modbus
- Dedicated HMI page
- Works with any version of GAP
- Works with any Coder version

Product Overview

The solution is based on independent add-in modules written in GAP, which retrieve Data from the existing GAP application, process them, and display the desired information. Add-ins do not alter any existing logic and can be removed without any broken or missing links, maintaining GAP integrity.

An independent HMI tool, based on Toolkit, is used to configure and display the maps that the add-in code makes available. For communication with DCS a Modbus list is pre-configured and can be linked to the existing port, or added (after customer agreement) to the existing Modbus list.



The following add-ins are available:

- Display up to five surge maps according four formats:
 - Discharge pressure vs. flow
 - Pressure ratio vs. flow
 - Head vs. flow
 - Reduced Head vs. flow
- Display actual steam map, based on actual K factor used
- Display actual start-up curves
- Display cause and effect with time stamping
- Provide proper and modern control identification (tag names, application ID, etc.)
- Provide monitoring of the actual compressor performance with model based supervision/comparison allowing for preventive maintenance.

ABOUT US

Maintaining an extensive inventory of Woodward controls and genuine spare parts, we provide a full range of services from engineering, design, installation and commissioning to aftermarket repair and maintenance support services for engines, turbines and power management systems.

One of our key competences is fitting new control, protection and actuation solutions on existing installations. This includes software and hardware design, documentation, parts procurement, assembly, factory acceptance and on-site testing.



Turner Range of Services

LSTK Projects, Retrofits & Upgrades
Turner ECS delivers reliable retrofit solutions for a wide range of prime movers and other applications. This includes lump sum turnkey projects on turbines and compressors.

Genuine Parts & Service Exchange
Turner ECS has the largest stock of parts, service exchange governors and electronics in Europe and can provide a fast turnaround service.

Product Training
Turner ECS can provide official Woodward product training covering both theoretical and practical training on a wide range of Woodward products.

Electronic Repair & Mechanical Governor Overhaul Service
Turner ECS provides a comprehensive overhaul and repair service for electronic, mechanical and hydraulic governors.

World Wide Field Service
Turner ECS field service engineers and technicians provide comprehensive solutions for commissioning and on-site repair.

Service Contracts
Turner ECS provides long term service contracts to support users with Woodward governors and/or control products and electronic control systems.

ROTATING EQUIPMENT CONTROL SOLUTIONS DELIVERED ACROSS EUROPE & THE MIDDLE EAST

Turner ECS is an official Woodward Channel Partner with offices located in:

- The Netherlands
- England
- Germany
- Italy
- Abu Dhabi
- Qatar
- Saudi Arabia

Turner ECS also operates and manages an extensive network of official agents throughout Europe & the Middle East

CONTACT INFORMATION

Turner Engine Control Solutions B.V.
Dirk Storklaan 76
2132 PX Hoofddorp
The Netherlands

Mail: sales@turner-ecs.com
Tel: +31 (0) 23 566 23 00
Fax: +31 (0) 23 564 27 27
Web: www.turner-ecs.com

